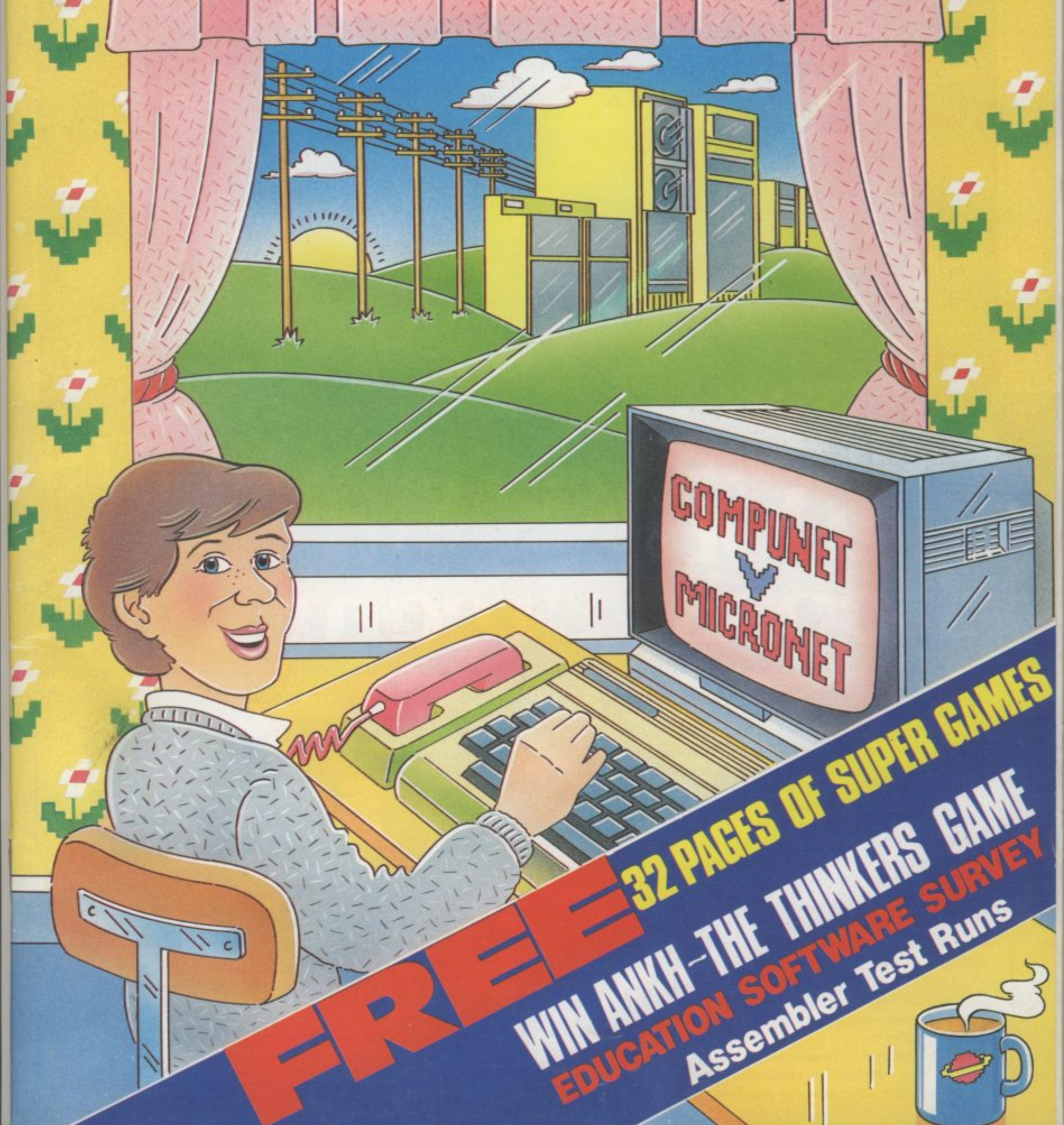
COMMODORE user

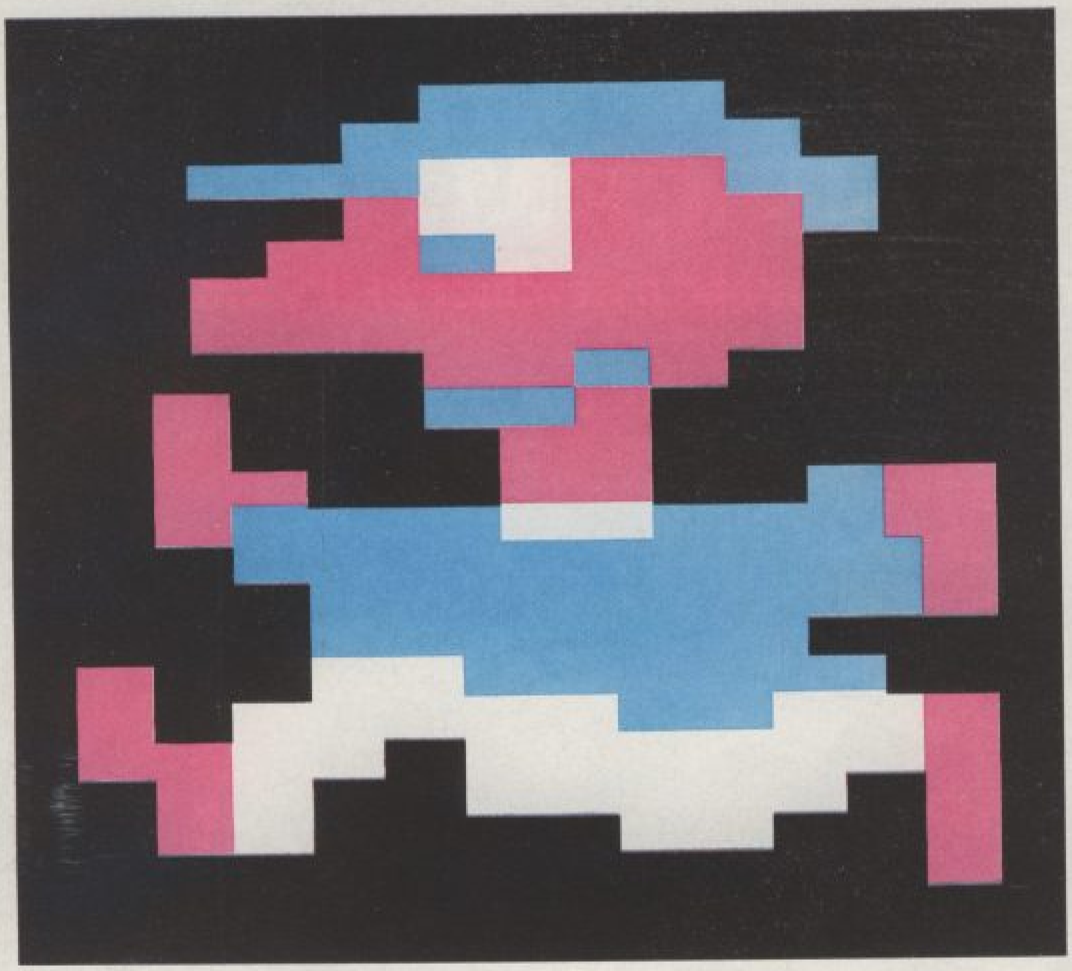
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January 1985 Price 95p




commodore 64

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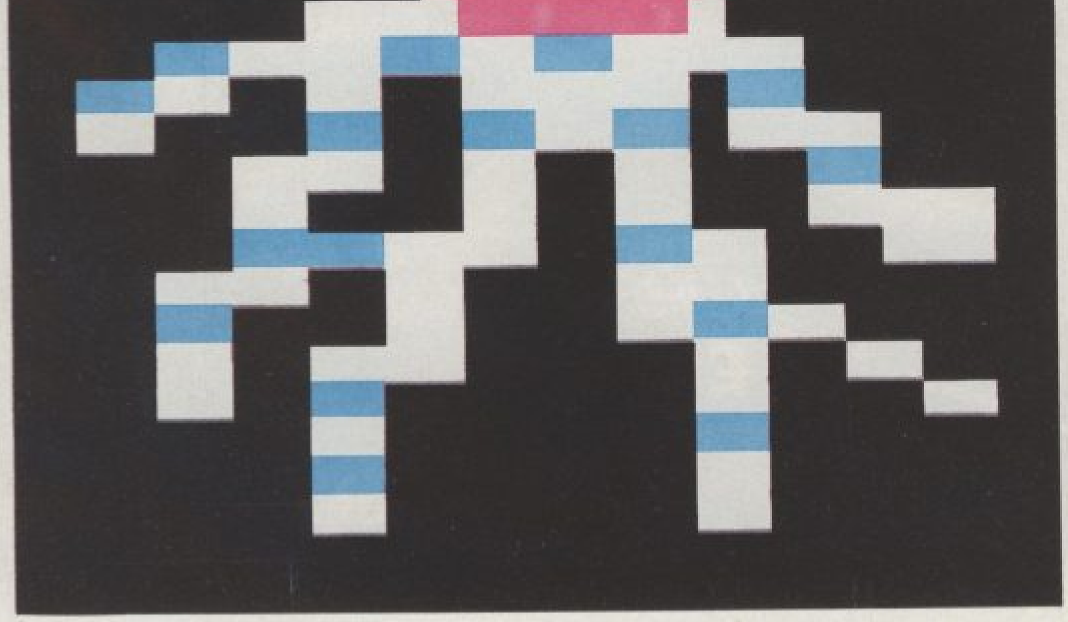
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- ease of use with icon driven commands
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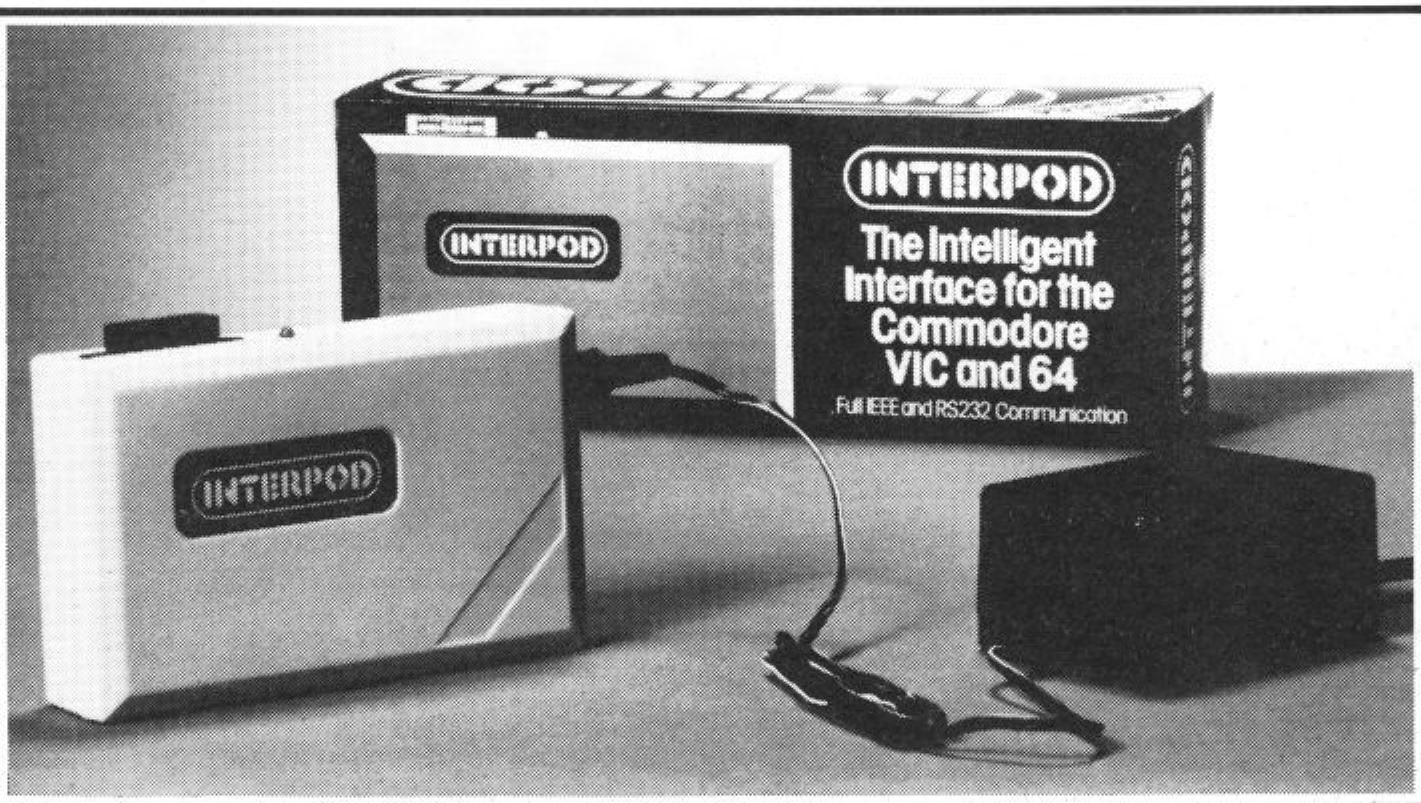
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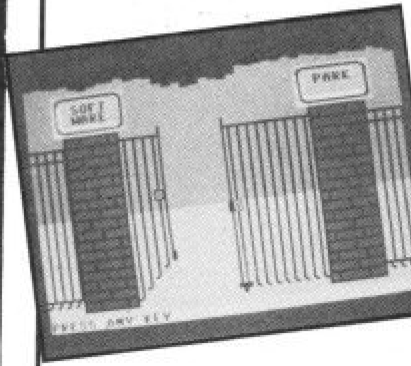
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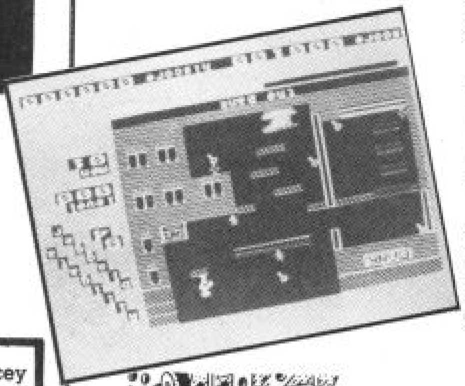
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Whichnet? Micronet 800 and Compunet – which one to choose? — 20

The Commodore 64 is probably the only home computer to have a choice of two communications networks. Both Compunet and Micronet 800 are jostling for position to get you hooked into the outside world. Which one should you choose?

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Time to round up the assemblers currently available for the Commodore 64. Ken Ryder and Dermot Williams have been putting through their paces Audiogenic's Monitor, Honeyfold's Doctor Watson package, Interceptor's Assembler 64 and Zeus 64.

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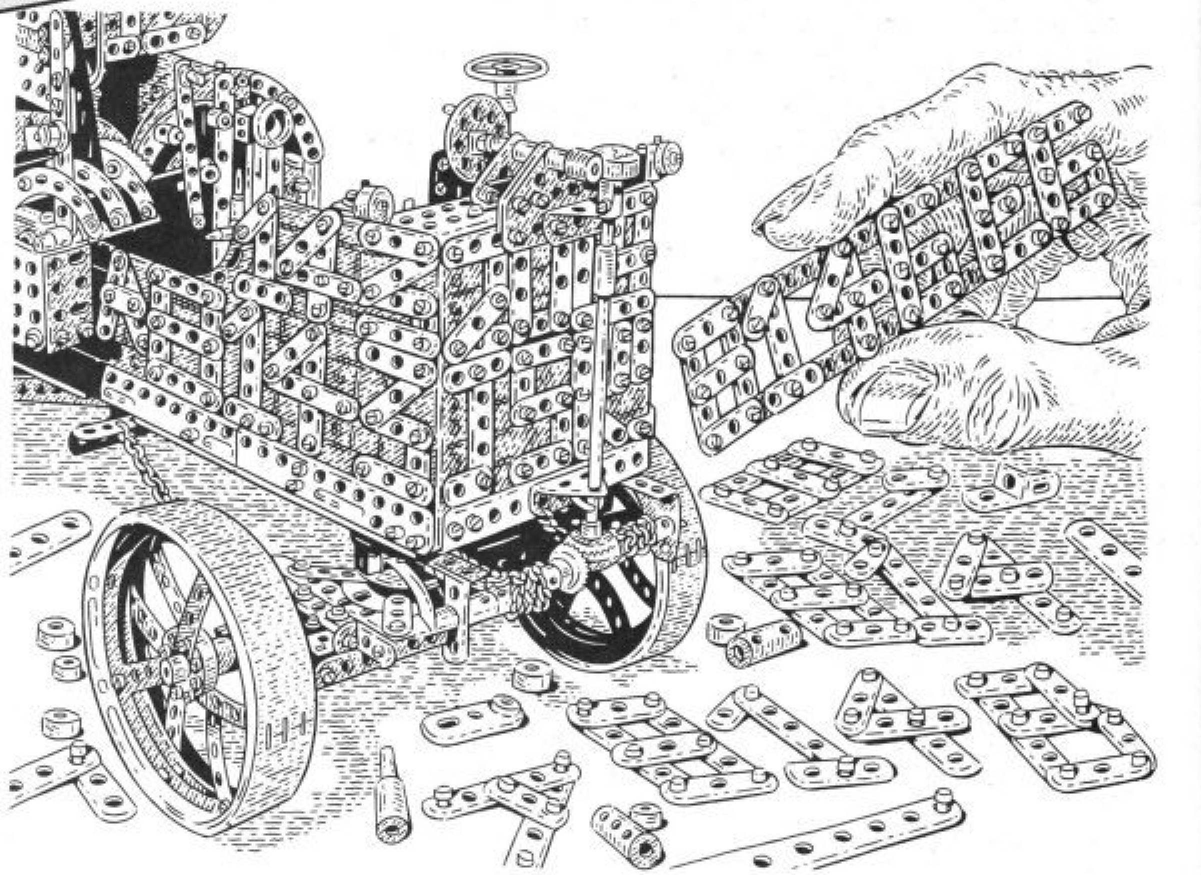
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Educational software for youngsters
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With its large memory, good graphics and sound, the Commodore 64 is a particularly good computer to use for educating youngsters. More and more software houses are releasing educational games, but will they really help teach your kids – and are they fun? Ken Young looks at the educational market and assesses what's currently available for the 64.

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52

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99

This month our regular adventure boffin, John Ransley, takes an in-depth look at the game that's making all the noise – Domarks's Eureka!

Dallas on business
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Like most people, Karl Dallas simply loathes doing his accounts. But he reckons an accounts package for his Commodore 64 might do the trick. So he's looked at programs from Gemini and Dialog to see if they will solve his (and your) problems.

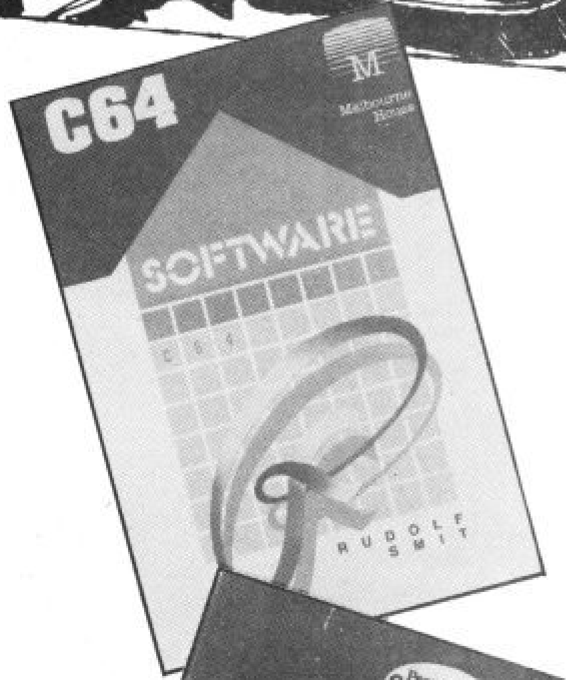
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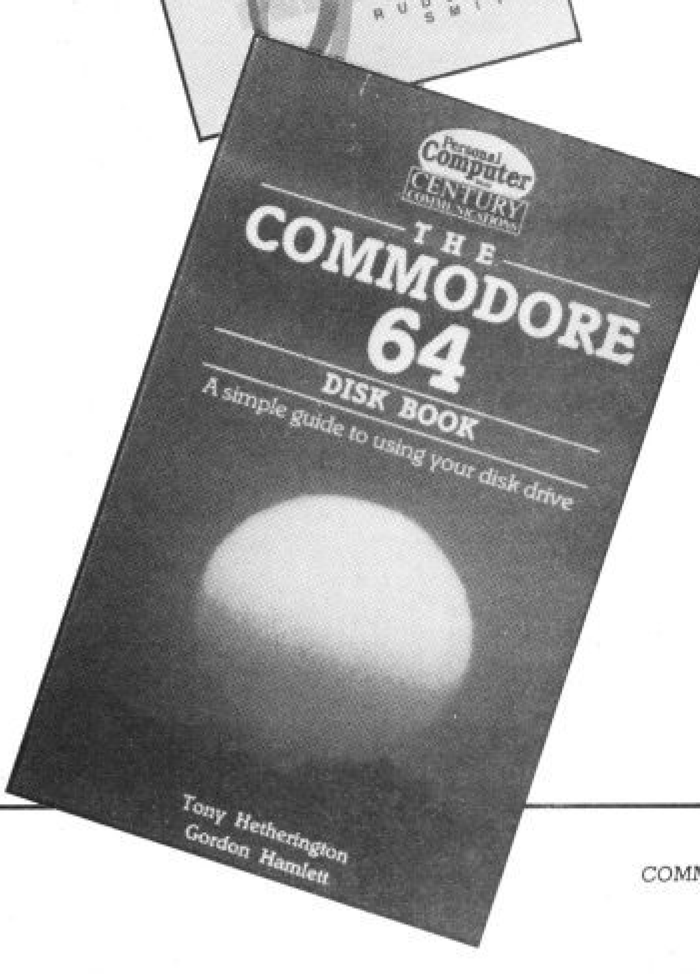
Rested from his Home Control series, Chris Durham looks at a commercially available alarm system controlled by a Commodore 64.

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Last but not least, Tommy faithfully answers your computing problems.







News

Commodore Corner

Commodore big-wigs must be glowing with pride and joy (rather like a Miss World or European Song Contest winner) because their very own pride and joy, the Commodore 64, has just been voted Home Computer of the Year for the second year running. Voted by whom, you may ask?

Judging was done by seven international computing magazines; from the UK, Germany, Italy, France, the Netherlands and the USA. None of them, by the way, were Commodore 'dedicated' magazines. That spurred Commodore on to make the claim that the 64 is currently the best-selling home computer in the world – a true rags to riches story?

Meanwhile, Commodore's latest machine the Plus/4, is in for some heavy promotion. Computer hardware retailers, the Spectrum Group has organised a competition in conjunction with Commodore to promote what's intended to be the 64's big brother.

What do you do? Well, just pick up a leaflet from any Spectrum store and enter the not very original competition to place six of the Plus/4's attributes in order of merit. Funnily enough, its built-in software (the facility most people thought Commodore was plugging) doesn't even get a mention.

The winner (and three friends) gets a seven-night holiday in Florida, squeezing in Disney World and the Kennedy Space Centre. You'll also get a holdall full of money (£2,500) to spend. Ten runners up get £100 gift vouchers. Funny, nobody wins a Plus/4? You'll have to hurry, though, closing date is December 31st.

New Year's games

64 owners are in for the cream of the new games launches for Christmas and the New Year.

Gone are the days when a top game appeared on the Spectrum first and was converted to the Commodore months later.

With the latest market research from Gallup showing Commodore neck and neck with Sinclair in terms of micros sold, many of the software houses are launching their products simultaneously for both systems.

Commodore owners are further privileged in that they can choose from the wealth of excellent Commodore software being imported from America by the likes of US Gold, Statesoft, Ariolasoft and Beyond.

Most exciting of the games in the US pipeline is **Conan** from Datasoft. The game is officially licensed from Lucas films and will challenge the muscle-bound star of comics and films to fight his way through seven progressively difficult games screens.

Action takes place in a castle chamber where flame monsters and flying dragons must be slain by Conan with his mighty sword if he is to win immortality.

Beating Conan in to the shops will be another hero of the big screen – **Indiana Jones** – protagonist of *Raiders of the Lost Ark*, and *Indiana Jones in the Temple of Doom.*

Indy's game is not based on any one of the films in particular but features a number of swashbuckling challenges typical of the screen adventures. There is an added challenge in *Indiana Jones* as the player has to work out what the objective of the game is as there are no specific instructions.

Indiana Jones and Conan will be the first launches in a new series of imports from US Gold entitled *Famous Names.* The games will be in the normal US Gold price range – £9.95 for cassette and between £12.95 and £14.95 for disk.

Conan is not expected to be in the shops until late January. Other titles appearing on the Famous Names label will be a new racing car game from Cosmi that US Gold are hoping will be endorsed by Nicki Lauda.

Stuntman Lee Majors jumps into the picture with the latest game from Elite – based on the TV show the **Fall Guy**. The player can take part in a number of dangerous stunts including train-walking and being whisked off the top of a burning skyscraper by helicopter.

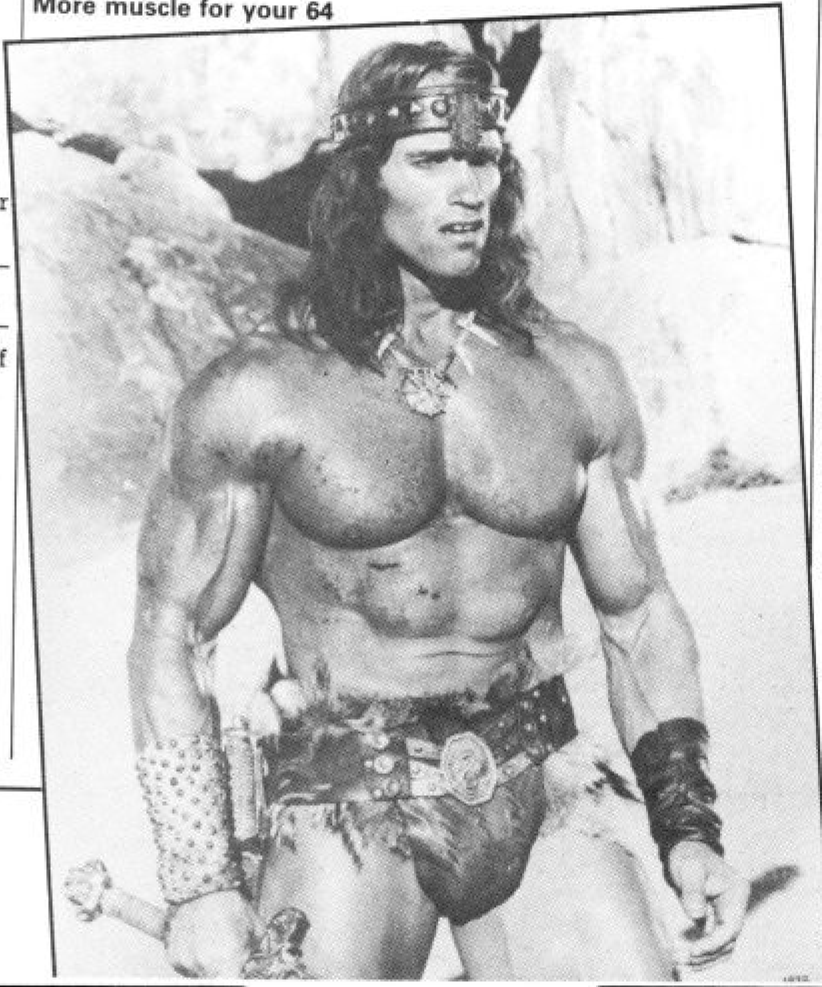
Spectrum game kings Ultimate are launching their first Commodore game for Christmas with **Jet Pac** – a game that challenges you to assemble a rocket, fuel it, and blast off to another planet. Also hoping to double the revenue from their Spectrum titles with Commodore conversions are Beyond Software who will launch **Lords of Midnight** and **Doomdark's Revenge** for the 64 in the New Year.

Mosaic are attacking the Christmas market with three new game-book adventures. **The Saga of Erik the Viking, The Nomad of Time**, and **The Stainless Steel Rat Saves the World** get the computer game treatment.

Still no sign of the **Great Space Race** from Legend, the long awaited sequel to Valhalla. This one could still just steal the show before Christmas although it will be hard pressed by Ariolasoft who are launching the entire Electronics Arts range at UK prices.

One thing is certain – Commodore owners with a bit of spare cash to spend on software in the New Year will have dozens of good games to choose from.

More muscle for your 64



SHORTS

Freddie and Alice on tape: *good news if you've always envied fortunate disk drive owners with their tuneful copies of Audiogenic's* Frantic Freddie. *The antics of that greedy telephone engineer are now available on tape, complete with Novaload, for £8.95. The same goes for* Alice in Videoland *which has a total of 90K machine code. Apparently, parts of the program have to be loaded whilst the game is in progress. Thanks to Novaload, that's now a feasible proposition on cassette, according to Audiogenic.*

SHORTS

Blunder in Reverse: *Vic* Victual *enthusiasts will have spotted our blunder in the November issue: we gave the assembly code but not the Basic loader for the* Reverse *routine. Here it is:*

```
10 FOR T=688 TO 716
20 READ A
30 POKET, A
40 NEXT
50 DATA 169, 0, 133, 0, 169, 30,
   133, 1, 160, 0, 177, 0, 73, 128,
   145, 0, 230
60 DATA 0, 208, 246, 230, 1,
   165, 1, 201, 32, 208, 238, 96
```

SHORTS

Doublethink: *faced with the problem of dealers who are no longer falling over themselves to stock Vic games, Anirog has compromised by producing duo tapes which play on one side for the 64 and on the other for the Vic (with 16K expansion). That may save shelf space for dealers, but what do you do if one side won't load? Eight titles are available: in the £5.95 range there's* Tom Thumb, Las Vegas, Minipedes *and* 3-D Time Trek. *For £7.95 you'll get* Bongo, Flight Path 737, King *and* Skramble *– at least you'll have more people to swap games with.*

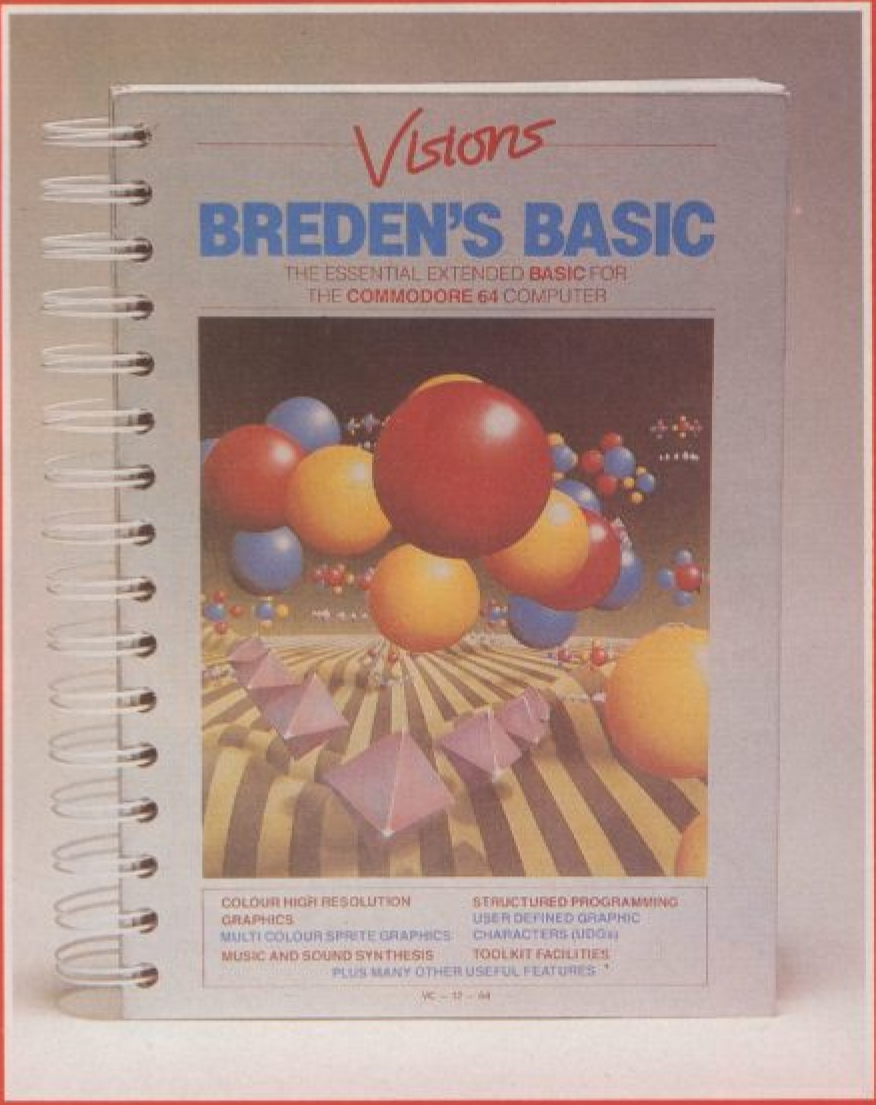
SHORTS

SID blunder: *we missed out a couple of program lines in last month's article on the SID chip. The lines will let you generate 'white-noise':*

```
10 SID = 54272: FOR L = SID
   TO SID + 24: POKE L,0:
   NEXT: POKE SID + 24, 15:
   POKE SID + 13, 240
20 POKE SID + 11, 129: FOR F
   = 0 TO 255: POKE SID + 8,
   F: FOR T = 0 TO 10: NEXT:
   NEXT: POKE SID + 11, 128
```

NEW FROM Visions

BREDEN'S BASIC



The **ESSENTIAL EXTENDED BASIC** for the Commodore 64 incorporating **HIGH RESOLUTION COLOUR GRAPHICS, STRUCTURED PROGRAMMING TECHNIQUES, MULTI-COLOUR GRAPHICS, USER DEFINED CHARACTER GRAPHICS, MUSIC** and **SOUND SYNTHESIS** and **TOOLKIT FACILITIES** plus many other useful features.

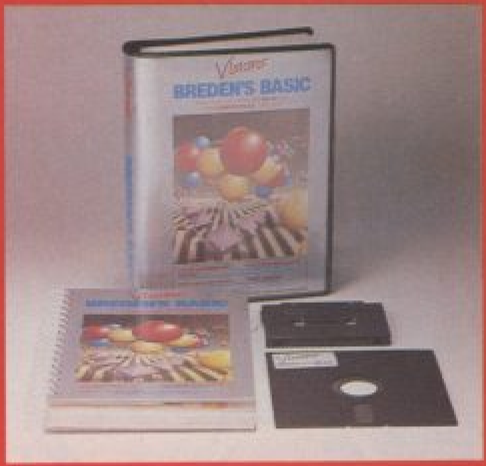
BREDENS BASIC has more commands (135) for the programmer to use than any other **EXTENDED BASIC** currently available, and drives the **SOUND** and **GRAPHIC** chips to their fullest extent short of writing in **MACHINE CODE.**

BREDENS BASIC is from **VISIONS** and as with all our products we've created a well written and **USER FRIENDLY PROGRAM** which is, the **MOST COMPREHENSIVE BASIC** yet available for the Commodore 64. Using **BREDENS BASIC** can only enhance the Commodore 64's versatility and its programmers ability.

BREDENS BASIC comes with both disk and tape, offering the user the facility to upgrade at such time as he acquires a disk drive. Running in **LESS THAN 8K BREDENS BASIC** allows plenty of room for program development with a **HIGHLY COMPREHENSIVE** and **EASY TO USE MANUAL** with a set of **HELPFUL HINTS** in the appendices. The **USER REGISTRATION DOCUMENT** enables us to update your software as and when Visions brings out new releases. **BREDENS BASIC** offers **GREAT VALUE FOR MONEY (39.95), A HIGHER DEGREE OF VERSATILITY** and **TREMENDOUS USER FRIENDLINESS.**

All in one **GREAT EASY TO USE PACKAGE.**

Visions Bredens Basic comes with a 180pp easy to use manual plus disc and cassette in a presentation box.



Available from leading stockists including Boots and W H Smiths or direct from address below. CMA1

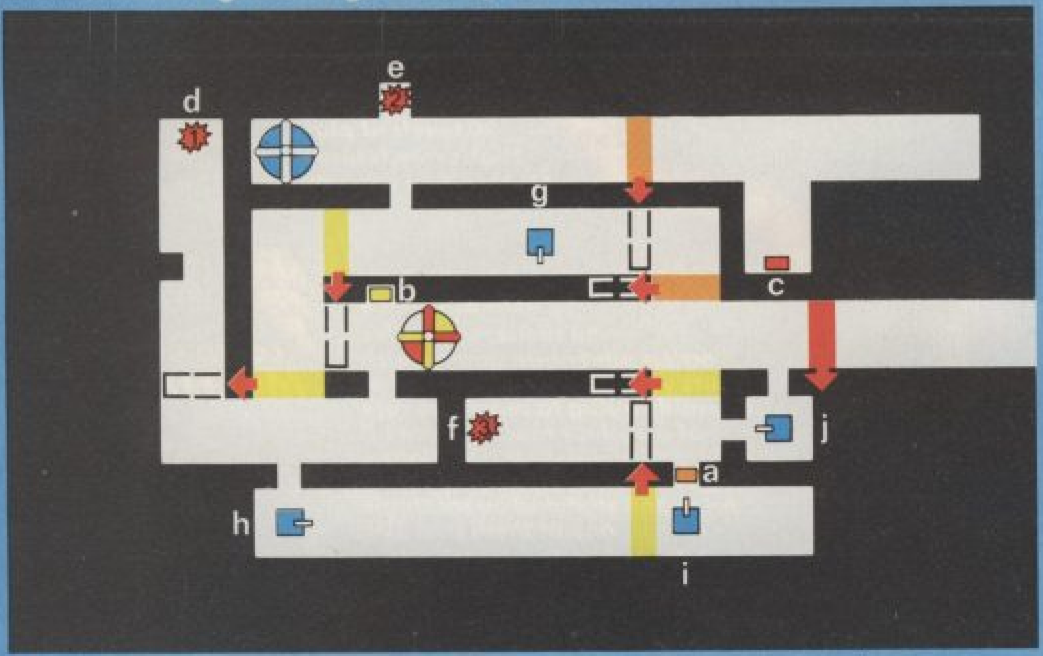
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ANKH Competition

Ankh is a unique puzzling graphic adventure from Beyond which doesn't use text but invites you to manoeuver your Mindprobe through a series of challenges.

These are treasures to be collected along the way; tools which may help you out in awkward situations; clues which can distract you or determine your next course of action.

Gradually the challenges build up as you battle through each problem, firing at keypads to open doors, probing the walls for new discoveries and learning to manipulate the word of Ankh. We have 25 copies of this incredible game to give away to the first correct solutions to the Ankh puzzle set out below.



- **A** Keypad to operate orange doors
- **B** Keypad to operate yellow doors
- **C** Keypad to operate red door
- **D** Control to move shadow probe right (once only)
- **E** Control to halt shadow probe (once only)
- **F** Control to fire from bottom of shadow probe (once only)
- **G** Downwards firing cannon
- **H** Right firing cannon
- **I** Upwards firing cannon
- **J** Left firing cannon
- Shadow probe
- Mindprobe

In Ankh you control a Mindprobe which can fire in four directions, pick objects up and put them down.

In the bizarre world of Ankh, sliding doors are activated by keypads which work when they are fired on. Strange cannons divert fire in different directions, controls move the ghostly "Shadow probes" around duplicating your Mindprobe's activities.

There is much more to the bewildering puzzles found in the 64 rooms of Ankh but here we have based a competition on just the elements mentioned above.

We have laid out a room consisting of several corridors with the way out being shown by the red door. The objective is to escape through the corridor beyond the red door but first you must open it – and the red keypad is not the most accessible.

Each keypad ▭ corresponds to the doors of the same colour. So the yellow keypad will operate every yellow door on the layout, each time it is fired at.

The doors slide back in the direction of the arrow and may block another passage by doing so.

The blue shadow probe can move and fire just as your own can but it must be stopped before it can fire. It moves at a third of the pace of your Mindprobe.

The controls for operating it are shown in red and will explode when they are fired upon, so they can be used once each.

Control 1 — Moves the shadow probe to the right

Control 2 — Stops the shadow probe

Control 3 — Makes it fire downwards

Remember each can only be used *once*.

For the purposes of this game, the only things you can pick up are the blue cannons.

These divert your fire in the direction they are facing. So if you fire at the right facing cannon from whichever direction, it will divert the bullet to the right.

You may only pick up and hold one item at a time by simply moving it and it doesn't hamper movement. But the probe cannot go through impossible gaps and only fires in straight lines. To enter fill in the coupon below. It can be done easily in under 20 stages. Use phrases like: "Fire at **A**; Explode **D**; Pick up **G**: Put down **G** at "X" on layout" (place an "X" on the layout).

We will be able to see from your order whether you have mastered the solution or not.

ORDER OF MOVES

Move 1	
Move 2	
Move 3	
Move 4	
Move 5	
Move 6	
Move 7	
Move 8	
Move 9	
Move 10	
Move 11	
Move 12	
Move 13	
Move 14	
Move 15	
Move 16	
Move 17	
Move 18	
Move 19	
Move 20	

Remember to keep a close check on the doors and where they are.

The first 25 correct entries will win a copy of Ankh.

The competition is not open to employees of EMAP Business and Computer Publications. Entries should reach this office by no later than 20th January 1985. The editor's decision is final and no correspondence will be entered into.

NAME ....

ADDRESS ....

....

....

SEND ENTRIES TO: ANKH COMPETITION, COMMODORE USER, 30-32 FARRINGDON LANE, LONDON EC1R 3AU

News

Jansen interface

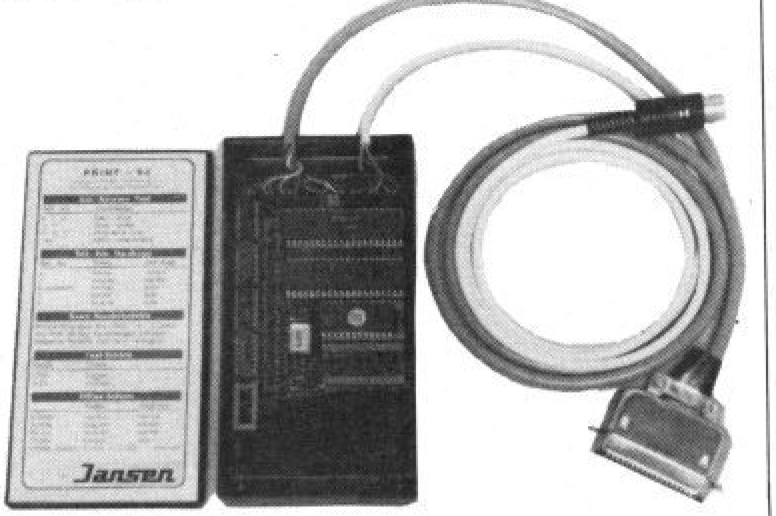
There's now a supermarket trolleyful of printer interfaces available for the Commodore 64 ranging from cheap offerings that need RAM-based software to drive them and offer few facilities, to the expensive 'intelligent' interfaces which do almost everything but boil a kettle. The new Print – 64 device from German-based Jansen Electronik, costs £83 and falls into the latter category.

It's a Centronics interface that connects to the 64's serial port. No extra software is needed as the device has its own processor, 8K of RAM acting as a buffer and an EPROM chip. It's especially adapted to drive a 9 by 9 dot matrix printer like the Epson or Star machines, so you could achieve print speeds up to 180 characters per second.

As expected, the device will print the complete Commodore character set both normal and inverted. Hi-res screen dumps can also be taken in four sizes. Those can be normal or inverted. Pictures you've created with a 'paint' package can be dumped to the printer, too, though obviously not in colour. The device compensates for that by selecting a different shade of grey for each of the sixteen colours.

But to do that, you'll need to use special commands on the floppy disk supplied (a cassette version should soon be available). That disk also contains a tutorial, complemented by a list of secondary addresses on the device's outer casing. The device is available now on mail-order direct from Germany. More details from: Jansen Electronik, 5090 Leverkusen Str, Unter Olbach 1, Germany.





Do you spend many hours typing in numeric data into your Vic or Commodore 64? If you find the conventional Commodore keyboard a chore, the Commercial Products numeric keypad may be just the thing for you. It costs £29.95 and connects in parallel with the keyboard, using no extra software. It features numeric keys, a point and a Return key. More details on 0293 545791.

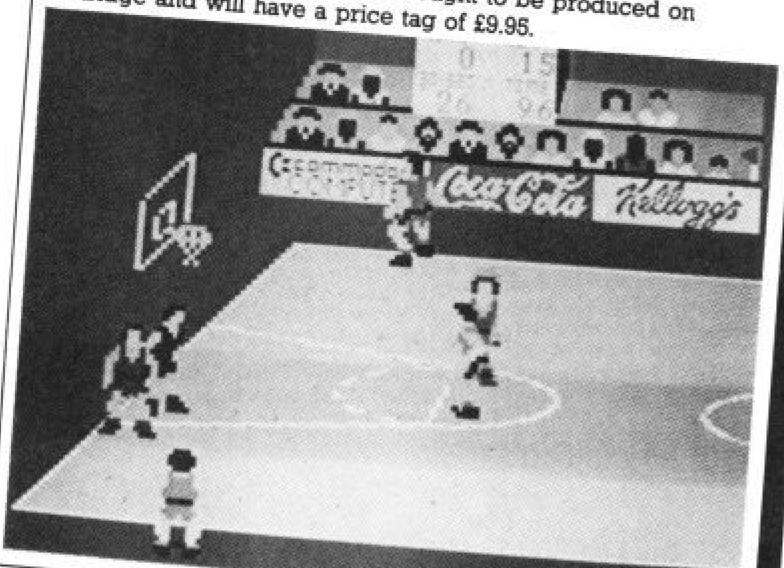
The long awaited sequel to Andy Spencer's enormously successful International Soccer cartridge is on its way. Sources inside Commodore tell us that the game is now in the fine tuning stage.

Its graphics are every bit as sensational as the football game's were, with cheering crowds, adverts on the stadium hoardings, and authentic movement of the ball.

The Commodore Soccer game was the most successful game ever produced by Commodore themselves – most of the hits coming from third party independents.

As well as the basketball game there are also rumours of a follow up to the first soccer cartridge – International Soccer II.

The basketball game is also thought to be produced on cartridge and will have a price tag of £9.95.



Books go soft

It's not news that book publishers are foraging a trail into the the computer software market. But most of them have, so far, produced only educational software for children. Now, Blandford publishers is producing a range of software for the Commodore 64 that complements some of its best-selling titles – of course, you get the book with the tape.

The packages, according to Blandford sales director, Chris Lloyd, are designed for people who require "a more serious application relating to his or her leisure and domestic activities; the tape enables you to make better use of the book". So what's Blandford offering?

First there's rock musician Dave Stewart's *Introducing the Dots* book, which teaches you how to read, write and arrange music. That process is now complemented by the accompanying tape. Then there's *Plan and Design Your Garden*, for which the program allows you some on-screen planning.

The Prediction Birthday File package contains the *Prediction Book of Astrology* and a tape that lets you keep tabs on birthdays and astrological profiles.

If your stars are more romantically inclined, there's *The Love Oracle* package which contains Guy Damian Knight's book The I Ching In Love. Apparently, this has something to do with predicting questions of love, relationships and marriage. Each book-and-tape package costs £14.95. More details on 0202 671171.

SHORTS

Hold the front page: *committed users of Wordcraft, whether it's the standard Pet version or the newer Wordcraft 64, now have their own Wordcraft-dedicated newspaper, published by Dataview Wordcraft. Called Wordcraft Express, it's designed to provide users "with a forum through which they can express views and opinions". More than that, the first issue contains a feature on an academic who's used Wordcraft to write a book in Old Icelandic. Whatever next? Copies can be obtained by writing to Amit Roy, Wordcraft Express, Radix House, East Street, Colchester CO1 2XB.*

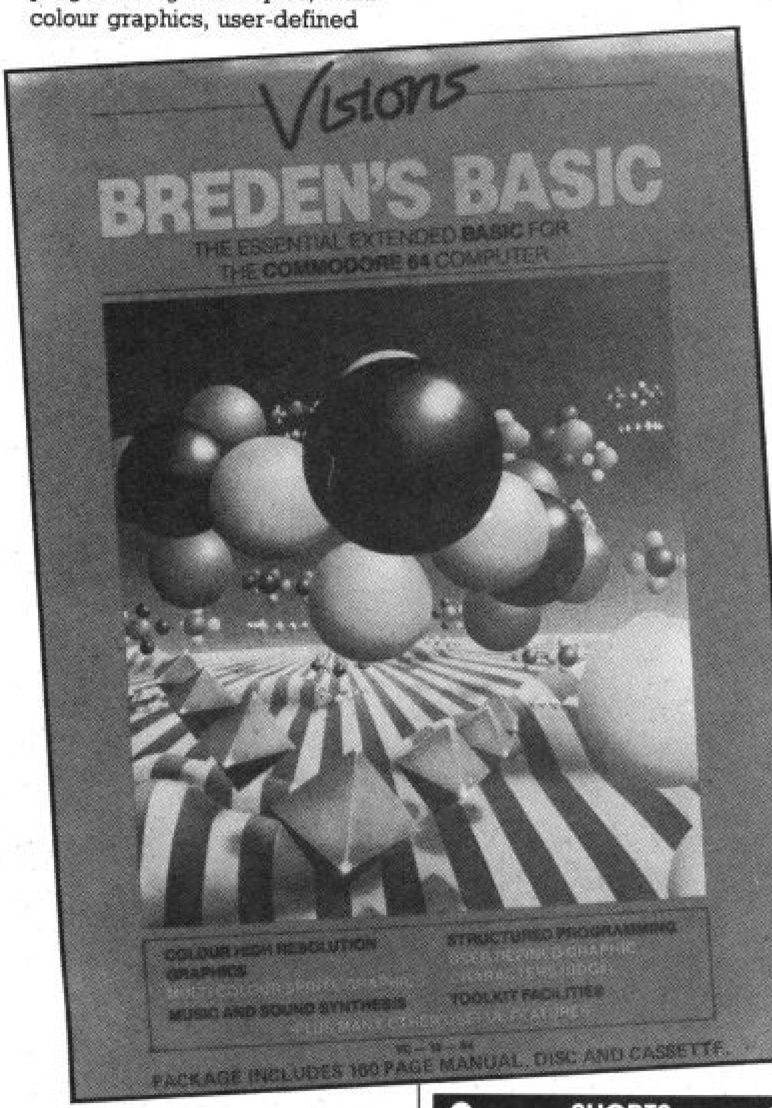
News

Pretty Basic stuff

Following in the wake of Simon, BC and David comes Breden's Basic from Visions Software Factory. Described by its progenitors as "the most comprehensive Basic available yet for the Commodore 64", here's a quick roundup of facilities offered.

The program has 135 commands running in 8K of RAM, incorporating hi-res colour graphics, structured programming techniques, multi-colour graphics, user-defined characters, music, sound synthesis and toolkit facilities.

The program comes in a library case and is well documented with a large and well-designed manual. Still, at just over £24, it doesn't come cheap. Sensibly Visions has packaged up both a tape and a disk so you can upgrade to a disk drive without having to throw the whole lot away. We're putting it on our future review list.

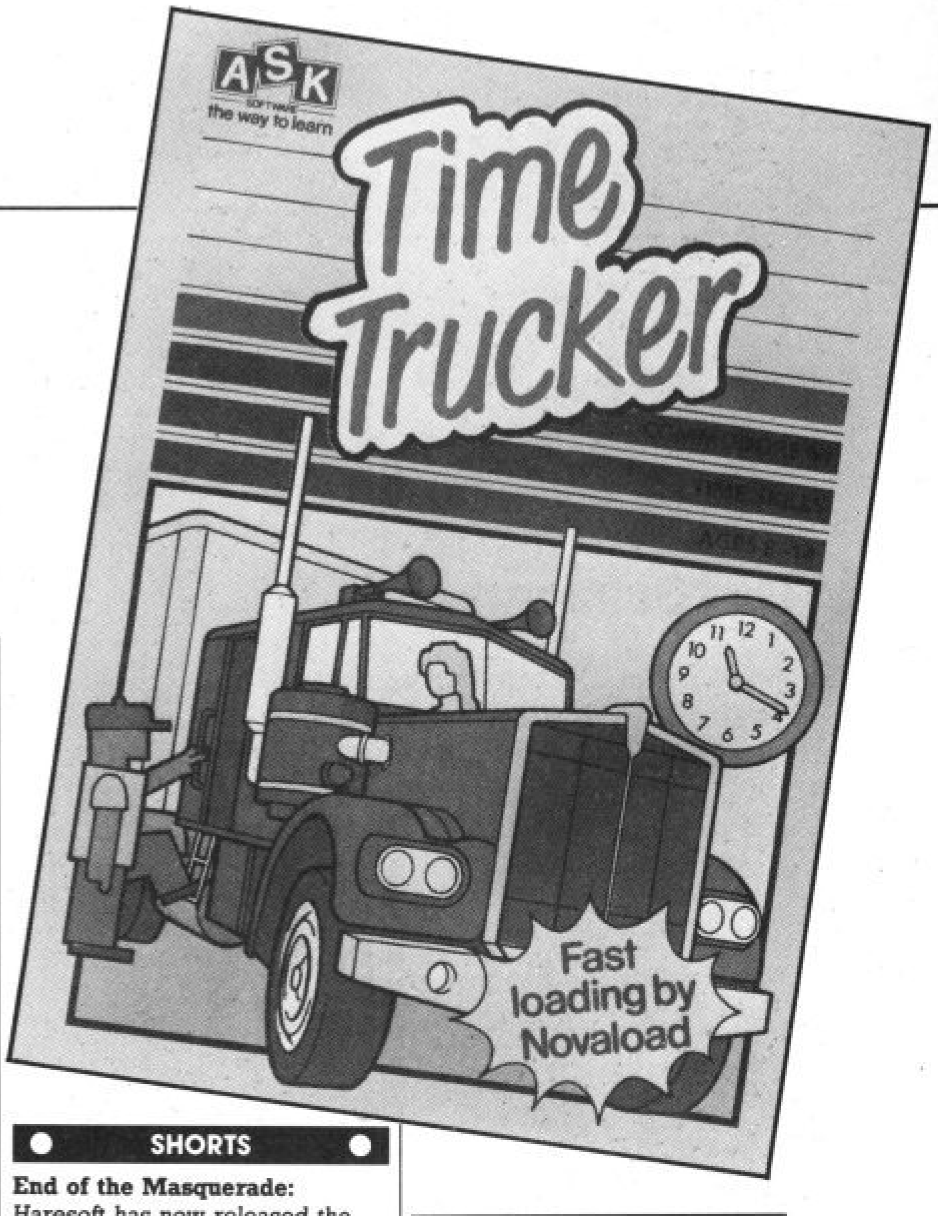


SHORTS

Crib card: *Phoenix Publishing has produced what it calls a "Crib Card" for the Commodore 64. The card folds up rather like a map and contains a wealth of reference information that should save you ploughing through the Programmer's Reference Guide. There's a section on Basic which includes syntax conventions, functions, commands and examples of how to structure Basic statements. Then there's the 64's character set, a default memory map, colour and control codes, SID and VIC chip registers, error messages – and a whole lot more. All that for £1.99.*

SHORTS

New man at Commodore: *Commodore has appointed a certain David Gerard as its new UK Marketing Manager, the aforementioned having marketed telephones and calculators before joining the great Commodore empire. "1985 will be marked as the year that Commodore broadened its horizons", opines Gerard. What horizons would they be? Well, to regain Commodore's "historic dominance" in the business market. With still no imminent appearance of the much publicised Commodore PC and Z8000 machines, Gerard will have his work cut out.*



SHORTS

End of the Masquerade: *Haresoft has now released the second and final part of its Hareraiser game. Called Hareraiser-Finale, it will also help you solve the first puzzle, putting you well on the road to winning the Golden Jewelled Hare, or £30,000. Haresoft reckons the winner will face a difficult decision whether to go for the money or the Golden Hare – we wait with baited breath.*

SHORTS

Turbo on disk: *Supersoft has developed a turbo loading utility which claims to speed up loading times from a 1541 disk drive by around three times. It's been incorporated into Supersoft's new Busicalc-3 spreadsheet. Don't worry if you've bought the sluggish version, the company is offering a free upgrade. More details on: 01-861 1166.*

SHORTS

First for books: *book lovers will remember that we reviewed two rather good books for the Commodore 64 from US publisher Abacus in the October issue. The range of four titles is now available from First Publishing in this country at a cheaper price. There's Anatomy of the 64 (£10.95), Anatomy of the 1541 Disk Drive (£10.95), Tricks and Tips for the 64 (£10.95) and The Commodore 64 Machine Language Book (£8.95).*

Learning to truck

Applied Systems Knowledge (ASK) the accomplished education software house which wrote Face Maker (amongst others) for Commodore and has written a large stack of educational programs for the BBC and Electron machines, has now released a game under its own name for the Commodore 64.

Called Time Trucker, it aims to help 8-14 year old children understand the relationship between the twelve-hour analogue clock (the one with the hands) and the 24-hour digital types.

It also explores the relationship between distance and time by getting you to drive a delivery truck, keeping to your time schedule and working out the best route – oh, and there's the inevitable road repairs to watch out for. With a little skill, you might become the Super Trucker.

The game comes on cassette, costs £7.95 and includes what looks like a useful twelve-page pamphlet. Unlike most educational games on tape, this one features Novaload so you're up and trucking in just over two minutes.

Letter from America

The soft side of the States

Dan Gutman reports

Last month, Dan Gutman made us all drool by telling us about the new American Commodore-orientated hardware we can't buy across our end of the Atlantic. This month, he's rounded up some unusual US software. Do you like playing with frogs?

I had the chance to meet your own Douglas Adams the other day. He was in New York for the introduction of *The Hitchhiker's Guide To The Galaxy* – the interactive novel. Infocom is distributing it in computer stores and publishing heavyweight Simon & Shuster is shipping it into book stores. It's very exciting. This is the first time a "name" author has written an interactive book. I think it ushers in a new age of literature, the same way *The Jazz Singer* revolutionized the movies.

Adams isn't the only author who has gone interactive. Trillium Software (which is really Spinnaker Software) has signed big-name writers Ray Bradbury (*The Martian Chronicles*), Arthur C Clarke (*2001: A Space Odyssey*), Robert Heinlein (*Stranger in a Strange Land*), and Michael Crichton (*The Andromeda Strain*) to turn some of their books into graphic adventure games.

Bradbury's *Fahrenheit 451* is already out for the Commodore, and I like it a lot. The game starts with you waking up near a pond in Central Park, and that's just a few blocks from where I live. None of the Trillium games have the depth of Infocom's all-text adventures, but they do have pictures, and that's important for some people. You can bet that other big name authors will be going interactive too.

Is print dead? I asked Douglas Adams that question and he replied, "Absolutely not. When radio came out, everybody said books will disappear. When television came out, everyone said radio will disappear. People find new ways of enjoying themselves. But there's something about the experience of reading a book which nothing else will replace. You can't take a computer game on the train."

Frogger falls apart

Probably the most outrageous piece of software ever has just come out for the Commodore – *Operation: Frog*, by Scholastic. It lets you do a simulated frog dissection! Those days of hacking up live frogs in biology class may be over now that we can do it on-screen. No blood, no mess.

You use the joystick or keyboard to remove 23 internal organs (including everybody's favorite, the gall bladder) and the computer tells you about each one. It's fun, educational, and there's something definitely warped about it.

The best part is that you can do something no scientist has ever done – put the frog back together. If you put all the organs back where they belong (and this is the best part), the frog jumps off the operating table and does a silly dance with a top hat and cane! This one is strictly for the younger set, but it's cool. For more information, write to Scholastic, 730 Broadway, New York, NY 10003.

On the road ...

One of the big debates in the US is, "What can you do with a home computer?" A lot of folks think computers are only good for playing games and word processing. But there's a new program out that has a real practical use – *Roadsearch Plus*. This is a computerized road atlas of the United States. All you've got to do is type in the city where you live and the city you want to go to, and the computer will calculate the shortest possible route.

Roadsearch Plus will also give you a printout of the detailed driving instructions, how long the trip should take, and how much fuel you will use. The program contains 406 cities and 70,000 road miles. (Write to Colombia Software, Box 2235W, Columbia MD 21045).

That may not be useful to you guys, but here's an idea – why don't one of you hot-shot programmers do the same thing with the map of England? You guys like to go on trips as much as we do. I'll tell you what, when you finish the program and you sell a million of them, just send me 10% of the profits. Do we have a deal?

Another new program you might be interested in is *Fast Load Cartridge*, from Epyx. It does what it says – it will load and power up disks five times faster than the Commodore disk drive, and copy disks ten times faster. You don't have to type any extra instructions into the keyboard. Just plug *FLC* into the Commodore cartridge port and it works automatically, even with the copy-protected disks. It's about the same price as a computer game. (Epyx, 1043 Kiel Ct., Sunnyvale, CA 94089).

A bunch of hot new games just hit the stores over here: *Championship Lode Runner* (sequel to Broderbund's *Lode Runner*), *Ghostbusters* (Activision, based on the movie), *Dragon's Lair* (the home version of the first laser arcade game).

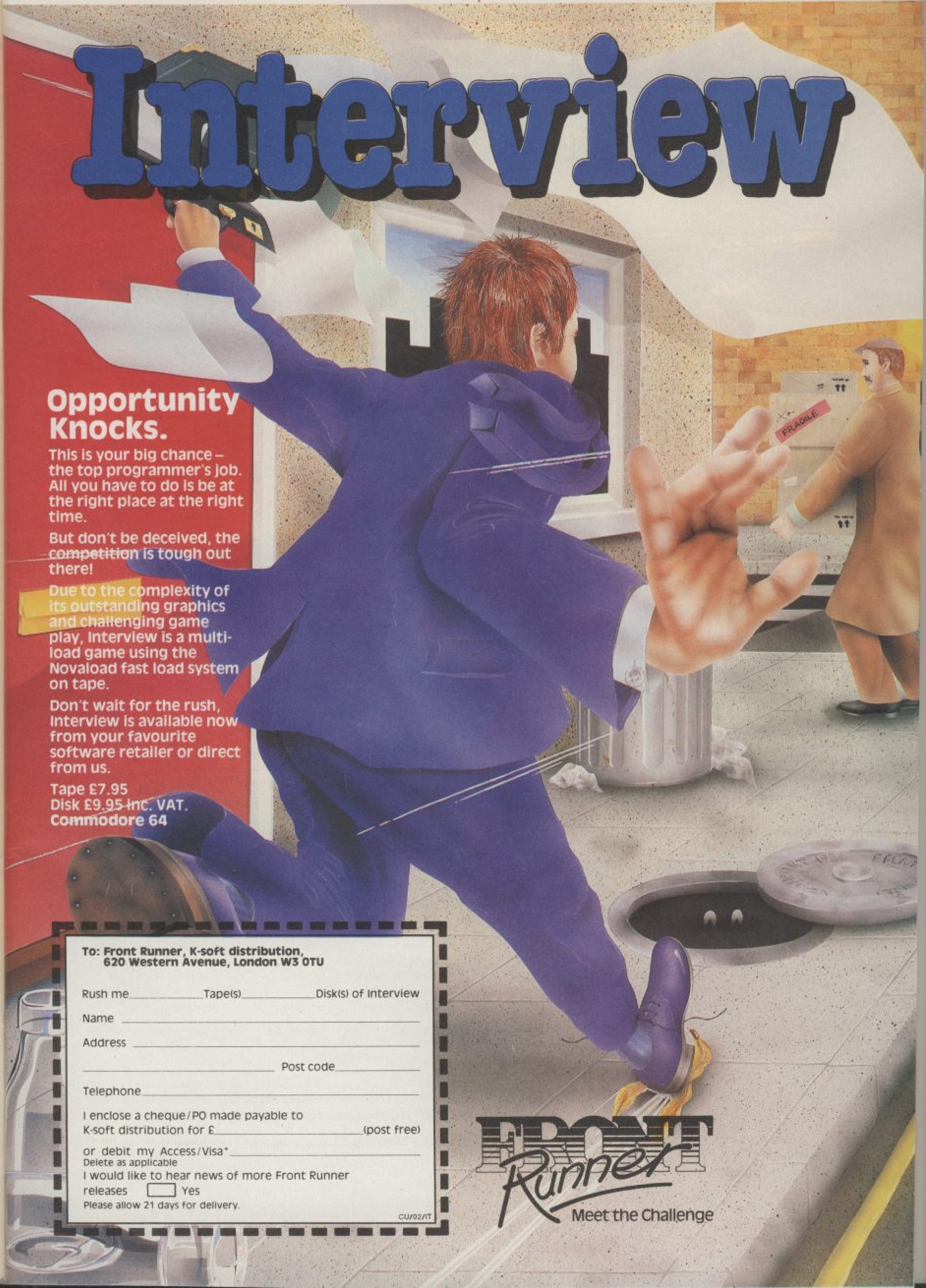
Gossip corner

While we all sit around and wait for the Commodore to officially introduce their new "Amiga Lorraine" computer, rumours are flying over what final form it will take. One programmer who I trust like my brother claims the machine will sell for just $695 including a disk drive, and that Commodore is working around the clock to write software for it. Another equally trustworthy magazine editor insists the disk drive will be 3.5 inches (like Macintosh), but the computer will sell for $1000.

Yet another "industry insider" claims the computer is powered by three new microprocessor chips, code-named "Agnes", "Daphne" and "Portia". I also hear there is a successor to the C-64 in the works – the C-128. How do you know who to believe?

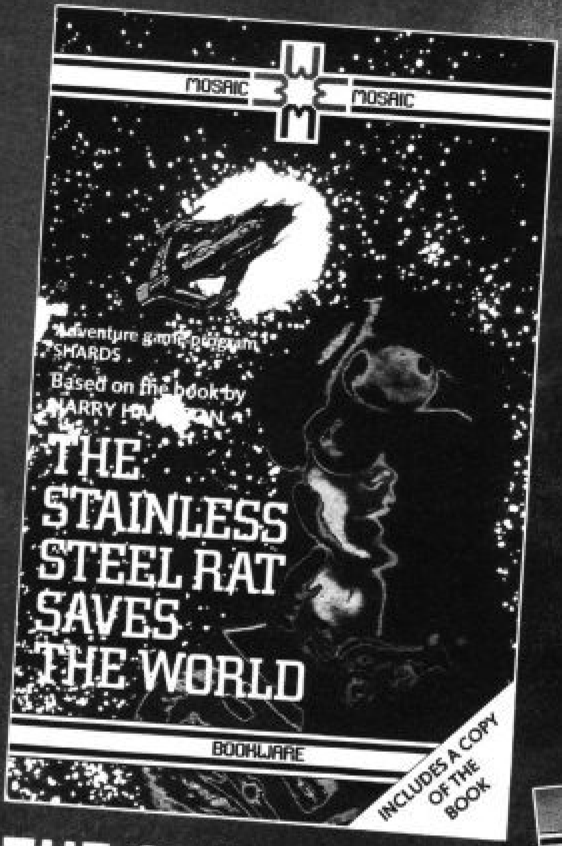
The Plus/4 is out, as you know, and a disk drive for it is coming in January. Unfortunately, neither is compatible with the Commodore 64. It's too early to tell how the Plus/4 is doing in the US, but some people are saying that several "key employees" at Commodore don't like it. They say it's not any improvement over the C-64.

A lot of these questions will be answered at the Consumer Electronics Show, which is taking place in January at Las Vegas. I understand the Commodore booth will be right next to the Atari one, and you know who owns Atari now – Jack "Business Is War" Tramiel! Jack started Commodore as a typewriter repair shop twenty-five years ago. He just started another price war, dropping the Atari 800XL to $120. Rumor has it, Jack's about to shock the world with a new machine at the show. I'll be there, and I'll let you know what happens. Isn't this exciting?



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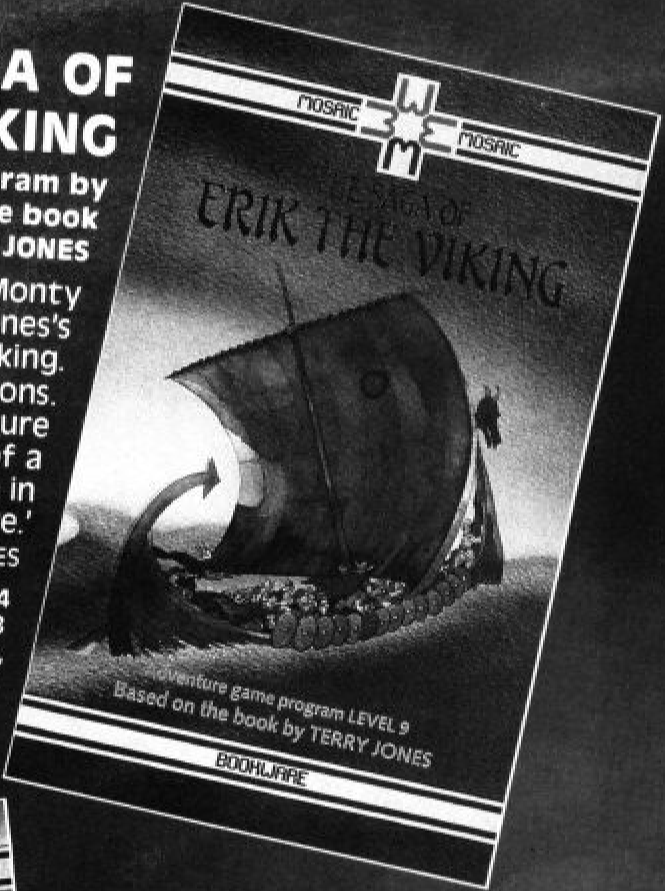


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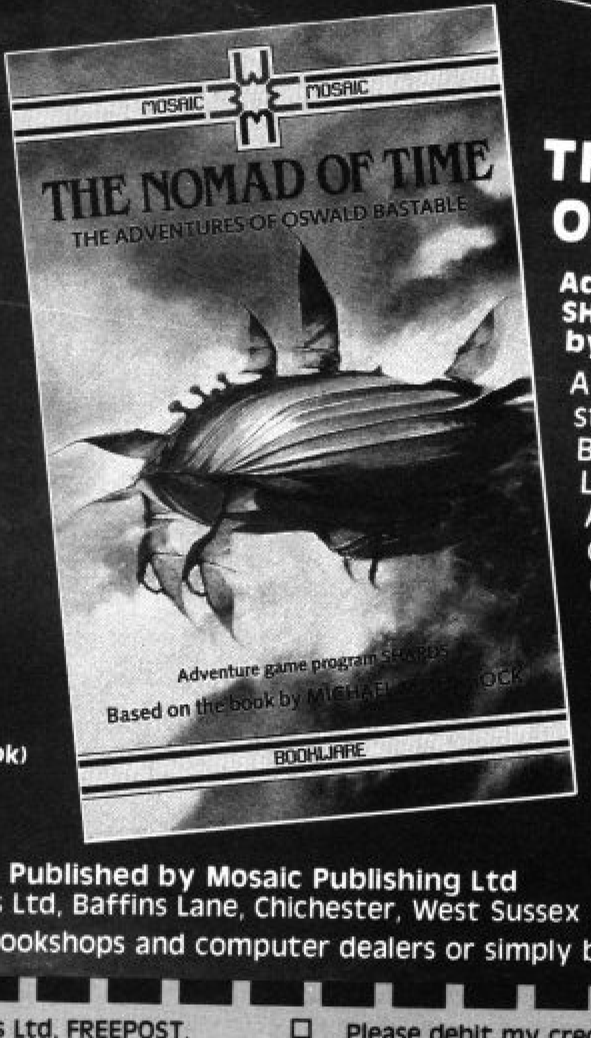


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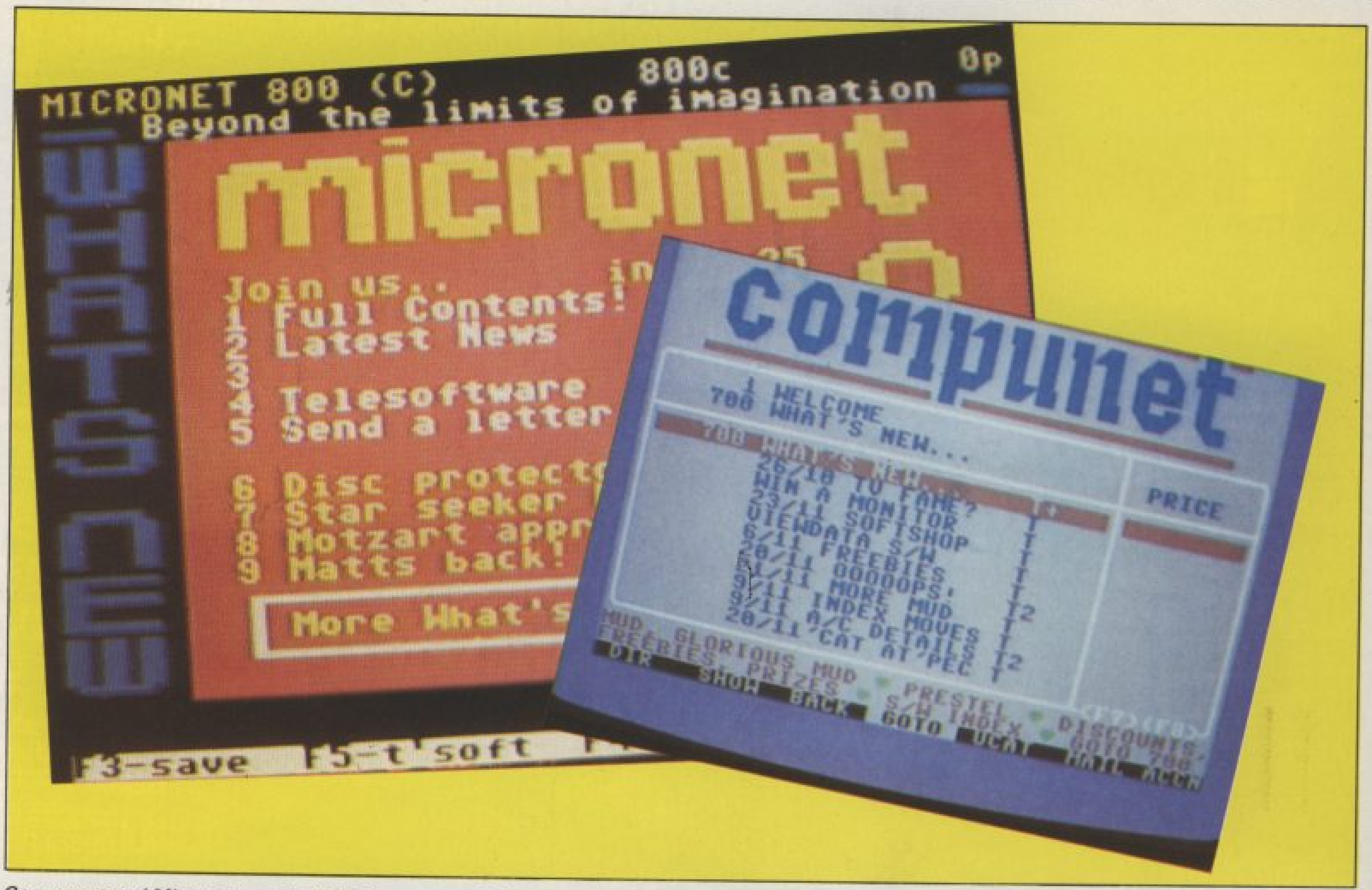
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Whichnet?

getting hooked on Micronet 800 and Compunet
by Brian Grainger and Ken McMahon

If the last megagame you bought now props up the kitchen table or you've thrown your Programmer's Reference Guide at the cat, you're probably suffering from acute computer boredom. But before you exile your Commodore 64 to the cupboard along with the skateboard and pogo sticks, there may be hope. You can now connect your computer to the outside world by subscribing to either the Compunet or Micronet 800 communications network. How do you subscribe? What equipment do you need? What's on offer? Which of the two is best for you? Brian Grainger and Ken McMahon have the answers.



Compunet and Micronet — the battle is on to get 64 owners into the modem clubs.

MICRONET AND PRESTEL

Before getting down to the nitty gritty I should perhaps introduce some of the ideas behind communication networks. We are all used to televisions, telephones and radios for feeding us audio and visual information. Some of you will also know about telex and telefax which are means of communicating the written word between business premises. In 1979 the idea of linking all three networks to enable transfer of information from a computer to a display terminal (your telly, to be less precise) via the phone network was launched to the public. The Prestel service was born.

A little bit of history . . .

The basic idea behind Prestel is that information provided by various sources, known not unnaturally as Information Providers (IPs), is stored on central computers. Users who wished to read the information would call up the computer using a keypad device connected to the computer via the phone line. The central, or host computer as it is called, would then transmit the information down the phone line to a receiving device, usually a converted TV. Although Prestel was aimed at the home user in an attempt to set the public to use their phones more during off-peak hours it was, because of the high cost involved, only business that used Prestel. In particular the travel industry has made use of it.

In 1982 as the home computing boom got into full swing it was realised that much of the equipment to use Prestel had already been bought by the home user. The computer had a keyboard and it had a display screen or could connect to a TV. The final link in the chain was a device to connect the computer to the phone network and allow data to be sent in both directions at the rates that Prestel would accept.

Prestel is set up to transmit information to the user at 1200 bits per second and receive information from the user at 75 bits per second. That device, called a **modem** (**mo**dulator/**dem**odulator) operating at 1200/75 together with software to drive it, was relatively inexpensive and they soon became available for the major computers such as the Pet,

Apple and BBC micro.

The computer owner now had the means to use Prestel. All he needed was a reason. This came in 1983 when Micronet was launched. East Midland Allied Press (EMAP) decided to become an information provider to Prestel and its 'pages' would contain information of interest to the micro user. More details a little later, but in essence Micronet can be regarded as an all embracing computer club. Because Micronet is a Closed User Group (CUG) only Micronet members, who pay a subscription, can actually see the information on the Micronet pages and use the Micronet facilities.

Again like a club, Micronet has several subsections dealing with differnt popular computer makes. A recent addition is a section devoted to Commodore 64 users. Finally, because Micronet is part of Prestel, all the general information from other IPs would also be viewable by the Micronet member.

Logging on

So let's go into a little more detail about the services available. I shall start with Prestel, of which all Micronet members are a part. The system is designed to be very simple to operate. With modem, TV and phone connected to your computer, it's simply a matter of dialling the local Prestel computer. Some modems will even save you a lot of bother by dialling the number for you provided you have previously stored it in the modem.

When the Prestel computer answers the call it will automatically send information to your micro and



MUD—the highly successful adventure game. Letters stand for Multi User Dungeons. Compulsive fun, but at £3 an hour you may end up in Mud Users Anonymous.

ask you for your individual identity number (ID). This number is only given to you when you register with Prestel. Again some modems will allow you to store this number and will automatically send it to the Prestel host computer when it is asked for.

On successful receipt of the ID the host will then ask for a password. This is for security purposes so that you have an individual code for use



Starnet — brainchild of Mike Singleton, programmer of Lords of Midnight. An interactive game for 1000 simultaneous players. Has suffered from persistent bugs.

with Prestel to ensure nobody else uses your ID to run you up a hefty phone bill. Obviously the modem will not give the password automatically so you key it in from the micro's keyboard. There is a facility to change the password should you wish to improve the security still further.

Having got these preliminaries out of the way Prestel will send you an index page which, like all pages, is displayed on your TV or a monitor screen. The particular page sent will be dependent on whether you're simply a Prestel member or whether you belong to Micronet as well.

A page on Prestel has a page number (up to 9 digits) and in addition can hold up to 26 different screen displays called frames. You can display the 'a' frame of any Prestel page to which you may have access by keying in the page number and giving the Prestel equivalent of the 'return' key (#). For example *800# will display the 'a' frame of Page 800 which is the Micronet front page. To see the b, c, d, . . . z frames, if they exist, you simply press '#'.

Each page also has associated with it up to ten routes to other Prestel pages which can be displayed by pressing a single key (0, 1, 2, . . . 9). These routes are set by the Information Provider and are used to guide users quickly to where they want to go. For example a page of news headlines may have routes to pages which give more detailed information on a particular news item.

Looking through the trees

This idea of an index page which routes to up to ten other pages (which may each in turn route to ten more and so on) is known as a tree structure and forms the basis of the Prestel information structure. While sometimes criticised by experts it is very easy to use for the beginner and unlike some networks I have tried will be mastered in no time at all.

Now showing on Prestel

Now we know how to move around Prestel what information is available? The following gives a guide:

- **News, Weather and Sport** — a number of IPs provide information on these topics.
- **Travel Information** — train times and aircraft schedules. The latter much easier to understand than ABC Guides.
- **Travel Guides** — information on most towns in the UK including

continued from page 21
suitable hotels to stay at. International destinations are also itemised.

- **Games** — a number of recreational pages appear on Prestel including a Dungeons and Dragons game.
- **Teleshopping** — provided you have a charge card like Access, Barclaycard etc. It is possible to order all manner of items directly from your micro. This includes computer equipment, household items and books. You can even book theatre tickets at certain theatres.
- **Public Information** — various Government bodies have pages on Prestel so that the user can get the most up to date information on services.
- **Electronic Mail** — you can send telex's within the UK. Send letters through Prestel to any other Prestel user (Mailbox).
- **Interest Groups** — contact services are available for many things. Want to get in touch with model railway enthusiasts? Then put out a message on Prestel and make some new friends. Want a new girlfriend/boyfriend? Then put a message on Simpatico.
- **Discussion groups** — it is now possible to send messages which are very quickly displayed to all Prestel users who might be looking. In this way discussions can be carried out between users logged on at the same time.

Services on Micronet

What about the extra services for Micronet members? Micronet has been very popular. It was the first IP to have a million frame accesses by users in *one month*. It is not hard to see why. It caters very well for micro users who happen to be an ever increasing proportion of the UK population. The following is a summary of what is now available:

- **Latest Computer News** — updated daily, this service really provides hot information. If you are thinking of buying the latest whizzbang computer then somebody on the Micronet team will have tried it a few days from launch and bring back some reality to the claims of the advertisements. Can't get to the latest computer show? Never mind, Micronet will report it day by day.
- **Help line** — got a computer related problem? Then send it to Micronet to put up on the helpline pages. There must be somebody looking who knows the answers.
- **Teach Yourself Programming** — a course in learning Basic is on Micronet.
- **Swap Shop** — got some equipment you no longer want? Then advertise it here.
- **Commodore 64 Microbase** — all the latest information on your favourite machine in one easily accessible area. That's the plan anyway, information is rather thin on the ground right now.
- **Clubsport** — all the major user groups put information here. ICPUG has over 100 pages of information on regional groups, technical tips, news, reviews and a cumulative index to the news letter.
- **Chatline** — Micronet's very own discussion group.
- **Telesoftware** — perhaps the most important area. Micronet pages are used to store programs which can be transferred down the telephone line to your disk drive. They can then be run at your leisure. Many programs are free of charge but some organisations are selling software this way as well.

Registering with Prestel and Micronet

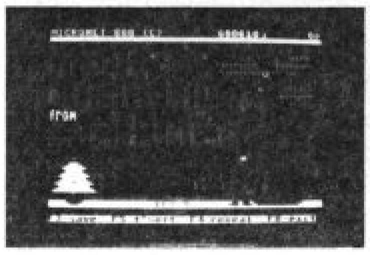
If that lot has whetted your appetite to join up with Prestel or Micronet you'll want to know what to do. If you only want to join Prestel then you will need a modem, software to drive it and you will also need to register with Prestel. A number of modems are on offer from **Tandata, Prism, OEL** and **Commodore** to name but a few. Expect to pay somewhere around £100-£150 by the time you have bought the software as well. It may well be towards the high end for Pet users. For enquiring about registering with Prestel phone the operator and ask for FREEPHONE 2043.

What you pay

If you wish to become a Micronet member then, if you are a 64 owner, all you have to do is contact Micronet. They have a suitable modem available, including software, at £123.65 including VAT. When you register with Micronet they will automatically register you with Prestel. The address for Micronet is Micronet 800, Telemap Ltd., Durrant House, 8 Herbal Hill, London EC1R 5EJ (Tel: 01-278 3143).

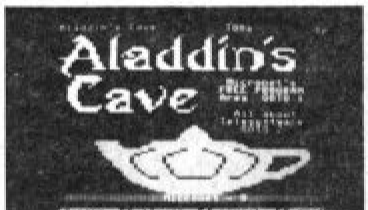
After the initial modem costs you pay for the services much as you pay for your phone. The Prestel service standing charge costs £5 a quarter to home users and Micronet an additional £8 a quarter. Provided you use the service during off-peak hours (18.00 - 0800 Mon-Fri, 13.00 onwards Sat, all day Sunday) Prestel do not charge for use. Certain Prestel pages will be charged for (such as commercial software) but most of the services mentioned in this article are free. Your phone costs while accessing Prestel/Micronet will be charged as normal through British Telecom.

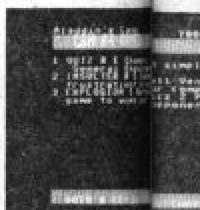
Micronet are particularly proud of their animated Christmas card. Traditionally strong on news, Micronet had a review of the new QL on-screen just twenty minutes after its launch. The database contains technical information.
Micronet's Aladdin's Cave of free software. Just three offerings in the Games section but much more in the pipeline including useful utilities. Starnet for interplanetary imperialists.
Compunet's Jungle — the most revolutionary part of the new system. This is your bit — write news, reviews, sell software or dead micros but be warned — the law of the jungle prevails. Compunet subscribers can win a monitor.
Compunet's free software area is called the Software Park. Contains two free programs from personality programmer — Jeff Minter. The Notice Board another free access area of Compunet.



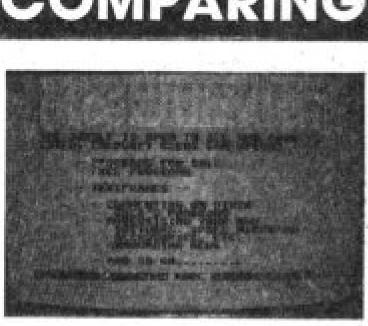
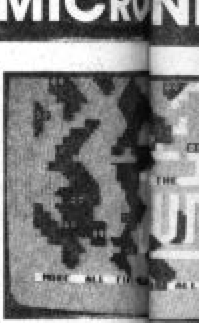

The most impressive thing about Micronet 800 is the massive amount of information available; there are literally thousands of pages of it. There is no directory structure as such, instead index pages inform the user as to what is available. Each item on the index is accompanied by a two digit number which when keyed in takes you, occasionally via a sub index, to the relevant page. There is also a facility to GOTO a page number directly.

This system of information retrieval is not quite as simple as Compunet's. For a start you have to use two hands which, unless you can write with a





COMPARING MICRON

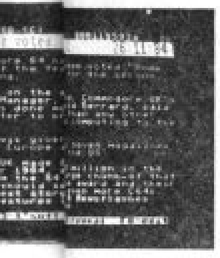



command whereas Micronet seems to respond instantly. This may seem unimportant but it can save you a lot of telephone time and when you're staring at the screen waiting for something to happen five seconds can seem like an eternity.

As far as software is concerned the major difference seems to be one of approach. Whereas both systems hold some of the titles produced by the big software houses, Compunet have a much more open attitude in that literally anyone can sell anything. So, if you like the look of it, you can buy the latest megagame on offer









pen in your mouth, makes life a little difficult. Also there are a number of commands to remember although there are usually plenty of prompts to help you out in this respect. Finally it should be pointed out that, for the moment at least, Micronet is much larger than Compunet. It should not surprise you if it's a little more difficult to find your way around.

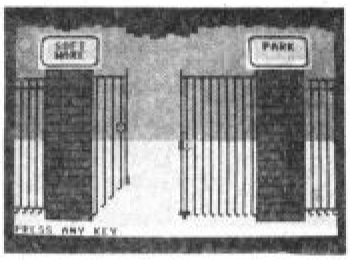
But anything Micronet lacks in this respect it more than makes up for by the speed of it's response time. Despite the fact that both systems operate at a 1200/75 baud rate, Compunet can take anything up to five seconds to respond to a





RONET AND COMPUNET

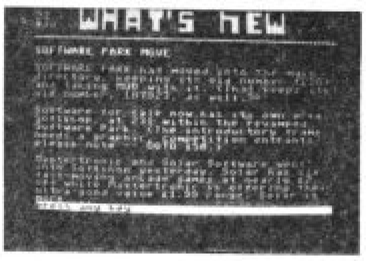




from Fred Smith in Barnsley. The drawback of course is that Fred's brainchild might not be the masterpiece of software engineering you expected. That's why Micronet don't do it.

That isn't to say that you can't sell software on the Micronet 800, just that it has to be very good. It's really much the same as selling it to any good software house. Micronet carry extensive reviews of much of their software as Compunet have now started to do. Compunet also have a facility for users to vote on software they have bought.





COMPUNET

Compunet is not nearly as old as Micronet 800. It was officially launched last September as an independent company, although it had originally been set up as a joint venture between Commodore UK and London-based ADP Network Services. Unlike Micronet, Compunet caters exclusively for the Commodore 64. Plans to extend it to other Commodore machines are still very vague.

Hooking into Compunet

As with Micronet, you'll need a modem to connect your computer to the telephone system. The most obvious choice is Commodore's own Communications Modem, for two reasons. For the price of £99.99, you get a free one-year subscription to Compunet, which can be renewed at an annual cost of £30. Secondly, only the Commodore modem (at present) will let you download software from the system — but more about that later.

The modem itself is a neat black box which plugs into the 64's cartridge port — you need no extra software or peripherals. The lead is about three metres long and plugs into a standard British Telecom jack socket. If you've got the old type fitting, a socket conversion will cost you around £15.

Where can you get the modem? Probably the best option at the moment is by mail order from Vicsoft. This means you will have to wait up to 28 days for delivery. If you are in a hurry you might try your local Commodore dealer. Commodore is now selling modems through dealers but it may take some time for stocks to filter through. I am reliably informed that Vicsoft have sold over a thousand modems yet there are only three to four hundred subscribers to Compunet so someone, somewhere must be holding on to a few hundred.

Once you've acquired your Commodore modem there is one more thing you must do before you can explore the hidden delights of Compunet and that is register with Compunet itself. There are two reasons why this is necessary. The first is so that they know where to send the bills — more about charges later. Secondly, you will need a user identity and password, these for reasons of confidentiality and your own protection.

Armed with modem, ID, password, and of course your Commodore 64 you are now ready to get to grips with Compunet. This is comparatively simple as it is handled by software in the modem. After typing CONNECT the computer will prompt you with a request for a number. You have the choice of twelve telephone numbers in various parts of the country, this being the case you shouldn't have any trouble finding a reasonably local one. There's even one in Luton.

As you type the number it appears on the screen so that you can check it, hit the Return key and the modem dials it for you. Magic! Once connected you will be required to enter your user identity and passcode, on entering this the main directory is displayed.

Getting around in Compunet

Information on Compunet is stored and displayed in the form of a directory system. Finding your way around is relatively simple once you know how. But to get started you need to know two things: how information is displayed on a directory, and how to give commands to the Compunet computer using the 'duckshoot'.

If you refer to the photograph of the Compunet directory you can see that the title of the directory page — Welcome — is displayed at the top with the page number (1) to the left. Below this is a list of all the items in that directory, up to a maximum of ten. Each directory consists of a page number, a title, and a code identifying the type of entry.

T indicates that a frame of text is present. This may be accompanied by a number: for example **T3** means there are three frames of text. **P** indicates a program (PP=means Protected Program). **D** indicates a directory entry without accompanying text. Occasionally **T** or **D** may be accompanied by a '+' which means there is a further sub-directory under this heading.

Great! I hear you say. But now I know what's there how do I get to see it? This brings us to the duckshoot. Not, as you would expect, a method of mass extermination for mallards, but simply an idiot proof way of telling Compunet what you want to do. The commands are as follows:

DIR	: Reveals another directory.
SHOW	: Reveals a text frame.
BUY	: Downloads a program.
SAVE	: Saves a downloaded program.
EDITR	: Accesses the editor.
HELP	: For when you get stuck.
LEAVE	: Disconnects you.
UCAT	: Displays a catalogue of your uploaded frames.

ACCNT	: Shows you your bill (best avoided!).
UPLD	: Uploads a text frame or program.
LIFE	: Used to extend life of entries.
PRINT	: Prints current frame.
BACK	: Returns to previous directory.
GOTO	: Goes directly to a numbered frame.
MAIL	: Accesses your electronic mailbox.
VOTE	: The Compunet clapometer — allows you to vote on software.

These commands are displayed on a continuous line at the bottom of the screen and can be scrolled past a window by using the cursor keys. When the command you require appears in the window you simply press Return and it is executed.

For example, say you wanted to see the text frame associated with the directory entry '*new dimensions*' at page 1000. Using the cursor keys you move the red bar down the screen until it highlights that particular entry. Again with the cursor keys, you scroll the duckshoot until the command SHOW appears in the window. Pressing Return reveals that frame of text. Once you've read it, pressing any key will return you to the directory. This particular entry is suffixed by a '+' which means there is a sub-directory with that heading. To see this directory you would use the duckshoot in the same manner, this time selecting DIR.

This method has the advantage that you only need to use one hand for cursor key operation leaving the other free for making notes of page numbers and other information. All Compunet's facilities are accessed in this way, from simply exploring the database to uploading your own textframes and programs for others to see and use. You can even charge for them.

Now showing on Compunet

Now you know how to find your way around Compunet you'll immediately want to know what's on offer. The introductory pages consist of an explanation of how the system works, what's available, and how to find it. This is generally a good place to start.

● **Latest computer news** — you can obtain the latest news and information about the micro industry. Some of this is provided by a character called (for reasons best known to him/herself) *Tiddles The Compucat*, whose big scoop at the time of writing is the inside story on The Great Prestel Hack.

● **Telesoftware** — if news is not your cup of tea, you could try downloading some of the software that's available. At the moment only a sparse number of titles are available. In the games bracket *Llamasoft*, *Mr Chip* and *Creative Sparks* (Thorn EMI) all have goodies for sale, although by far the biggest supplier is (you guessed it) *Commodore*. A lot of the software is free, one example being an excellent game by Jeff Minter called Syncro.

Generally speaking, though, don't expect too much from the free software. The commercially available titles cost slightly less than they would in the shops. This seems only fair as the user is forking out the price of a disk or cassette instead of the manufacturer. One important point: if you download commercial software, the modem used to receive it must be plugged into the Commodore 64 or the program will not run. For more serious users utilities, business, and educational software are available, everything from a spreadsheet to a spelling tutor.

● **The Jungle** — you can also download software here, but basically it's an area of Compunet given over almost entirely to users. In this instance the law of The Jungle is a sort of controlled anarchy. Primarily it's a bulletin board on to which users can put anything they like, and they do. The main directory divides The Jungle into six main areas — software, small ads, clubs and societies, hobby corner, user noticeboard, and jobspot. Of course there's nothing to stop you putting your small ad in the software section, but it helps if you try and maintain some semblance of order. The software here isn't always of the highest standard, but that's the price you pay for interactive freedom. The payoff is that this is one of the most interesting and amusing parts of Compunet.

● **MUD** — no description of Compunet would be complete without a bit of MUD. MUD or Multi User Dungeons is an adventure game originally developed at Essex University by Roy Trubshaw and Richard Bartle. It has now been made available on Compunet by *Century Software*.

The great thing about MUD is that any number of people can play it at the same time. Hence you can be wandering through The Land minding your own business when you bump into Fred the Warrior. You can have a chat with Fred, join forces with him and help each other out. Alternatively he may kill you. The permutations are therefore endless and you have to watch out for yourself.

If you're very good and reach the level of Wizard you become all powerful and everyone has to watch out for you. The only drawback to MUD is the cost which is £3 per hour plus the phonebill while you are online.

What you pay

Speaking of money, use of Compunet will involve spending some. Connect time between 8am and 6pm is charged at a rate of £7 per hour. Compunet is free after 6pm and at weekends. Storage of a textframe costs 1p per day and if you sell any software Compunet will charge you 40% of the sale price for distribution. Compunet will bill you quarterly or when you run up £50 worth of debt, whichever is the sooner. I've found that using the system when it's free and exercising a certain amount of care over what you buy keeps costs reasonable.

Which one is best?

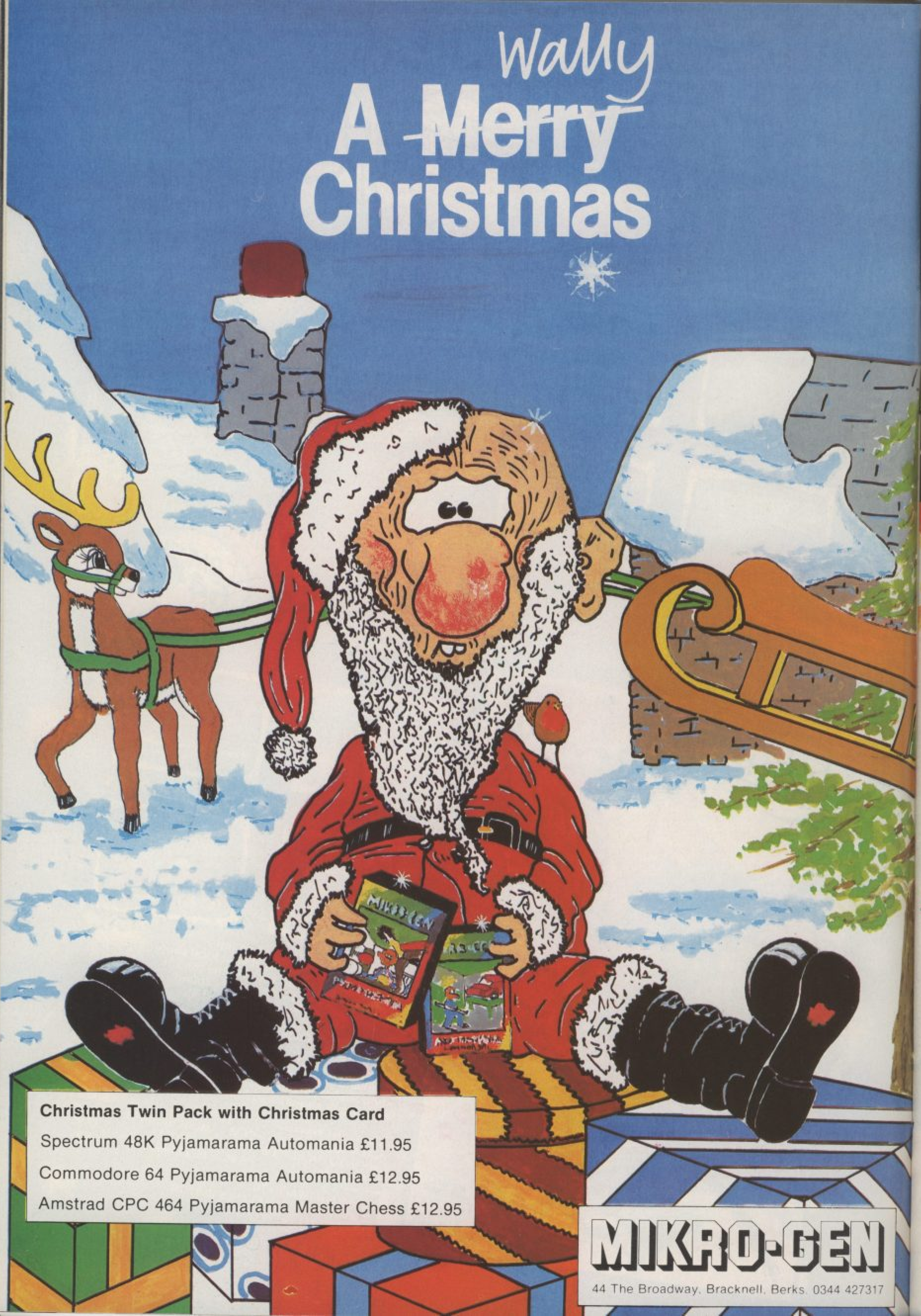
Now we come to the crux of the matter. Which one is best? By now I'm sure most of you will have made up your own minds and besides, nothing's ever that simple. However, for the time being at least my money is on Micronet. When it comes down to it the main purpose of these systems is to provide information and Micronet 800 has stacks of it. It is also very broad in scope. As well as Commodore 64 information and software it offers information on other computers, software and peripherals.

Compunet on the other hand is comparatively small, but it's growing. The one big thing that it has going for it is it's ease of access. In The Jungle you can set up your own bulletin board, club or society, even your own software house. Given an increase in the number of subscribers (there are under 600 at present) it's anybody's guess where this might lead.

The choice is therefore up to you. If you want lots of information now and your maximum input is unlikely to consist of no more than the odd piece of mail or a response frame then Micronet 800 is for you. If uploading your own software, articles, etc. and having a more positive input appeals you will probably get more satisfaction from Compunet.

But one last point may swing it. I have it on good authority that you can now log on to Micronet 800 using the Commodore modem and a piece of software by Viewdata available free on Compunet. You can therefore enjoy the best of both worlds for the cost of the Commodore modem, the software and the quarterly subscription to Micronet (£13).

So if having read this you still can't make your mind up, the answer is obvious. Use both. At £125 all in, it's not as horrendously expensive as you would have thought.

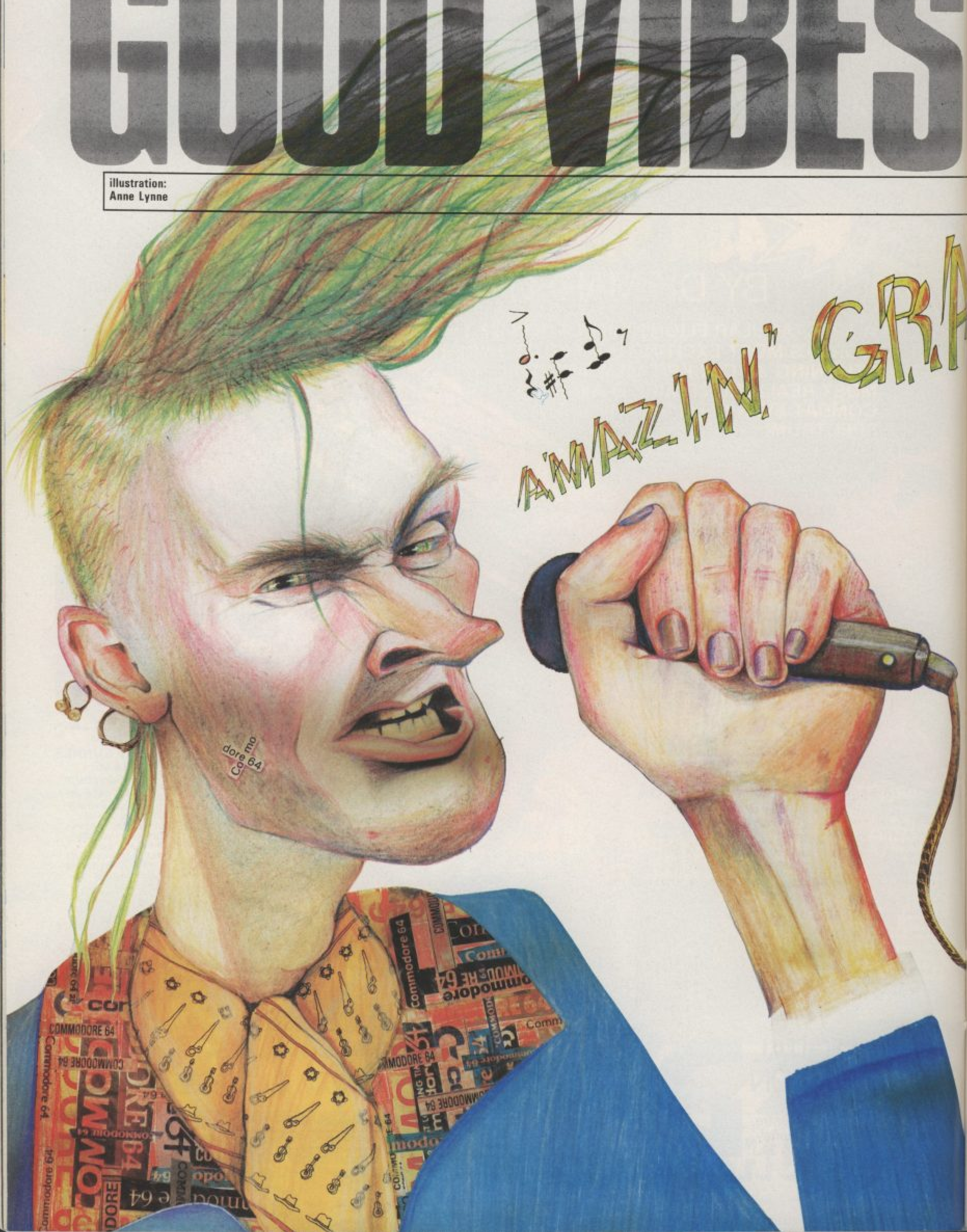

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GOOD VIBES

illustration:
Anne Lynne



S FROM SID

ADDING VIBRATO TO YOUR MUSIC

If you listen to a lot of music, whether it's pop, jazz or classical, you have almost certainly heard a singer or instrumentalist use vibrato. Vibrato warms the sound of a solo line and makes it more expressive. In fact, we sometimes say that vibrato "humanizes" the sound — just what the doctor ordered for that cold silicon fish inside the Commodore 64 that we call the SID chip.

It's not especially difficult to add vibrato on the Commodore 64, but before getting into the how-to aspect of things we had better figure out just what vibrato is.

Actually there are a number of different ways to produce vibrato, but basically it consists of a regular variation in pitch and/or loudness. Think of a violinist or a guitarist: on a held note the player's finger rocks back and forth on the fingerboard. This "vibrating" of the hand causes the pitch to rise and fall. Or think of a jazz trombonist playing a ballad. The trombone slide is moved back and forth on a held note, causing a similar effect. These are both examples of pitch vibrato, although there is some variation in loudness also.

Some wind instruments, most notably the flute, vary the wind pressure to produce a vibrato. This produces, as you might guess, a variation in the loudness of the sound, along with a slight variation in the pitch.

The amount and speed of the variation are quite important. For example, you would use a wider, slower, more noticeable vibrato for jazz than for classical music. Or, if you're an opera fan, think of the opera singer who has sung too many Wagner operas and thus has nothing left but vibrato — he or she probably won't be coming back for an encore.

Producing a vibrato

The easiest vibrato to produce on the Commodore 64 is a pitch vibrato. Type in this program to see how:

As you can see from the REM statements in lines 50 and 70, this program simply raises and lowers the pitch a little bit. How did I figure out how far to go each way? By experimenting, of course. The speed of the vibrato is controlled by the **STEP2** and **STEP-2** statements: **STEP1** would produce a slower vibrato, **STEP3** a faster vibrato.

If you want to, you can change the amount of vibrato by changing the amount that "A" is allowed to change: if "A" goes up to 245 and down to 145, for example, you'll get a far different sound.

The problem with this technique is that it gets tiresome to program. If you would like an automatic pitch vibrato that works on the interrupt system so you don't have to worry about all of those FOR/NEXT loops, type in this next program:

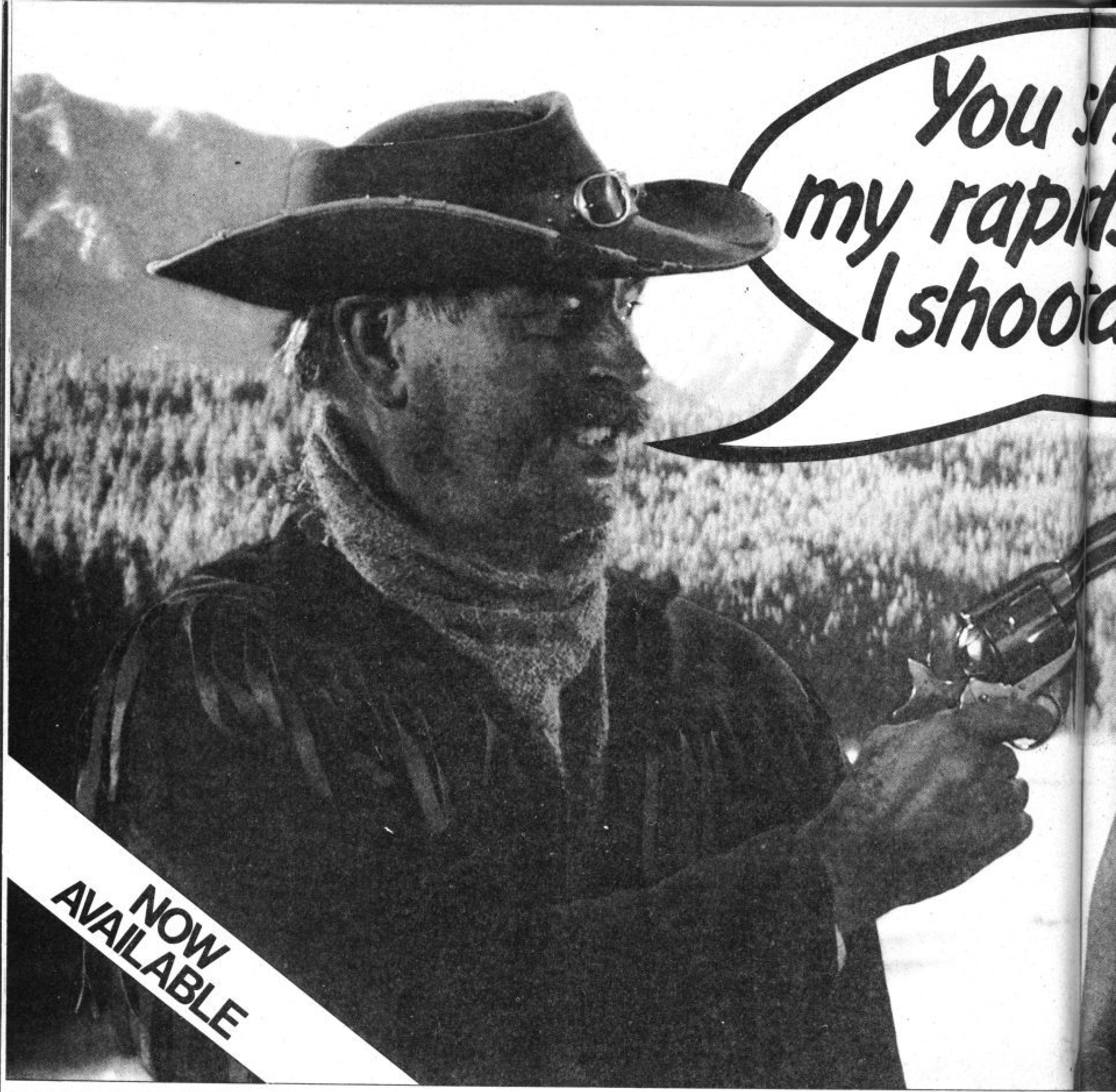
continued on page 32

PART ONE

```
10 A=195:SID=54272:FORL=SIDTOSID+24:POKEL,0:NEXT:REM:INITIALIZE
20 POKESID+24,15:POKESID+5,32:POKESID+6,249:REM:SET VOLUME AND ADSR
30 POKESID,A:POKESID+1,16:POKESID+4,17:FORREPEAT=0TO20:REM:START NOTE AND LOOP
40 FORA=195TO213STEP2:POKESID,A:NEXT:FORA=213TO195STEP-2:POKESID,A:NEXT
50 REM:GO UP JUST A LITTLE AND BACK DOWN
60 FORA=195TO177STEP-2:POKESID,A:NEXT:FORA=177TO195STEP2:POKESID,A:NEXT
70 REM:GO DOWN JUST A LITTLE AND BACK UP
80 NEXTREPEAT:FORT=0TO1000:NEXT:POKESID+4,16
90 REM:LOOP BACK 20 TIMES, PLAY THE NOTE WITHOUT VIBRATO, THEN STOP.
```

PART TWO

```
10 FORA=49152TO49341:READD:POKEA,D:NEXT
20 SID=54272:FORL=SIDTOSID+24:POKEL,0:NEXT:POKESID+24,15
30 POKESID+5,160:POKESID+12,160:POKESID+19,160:REM:SLOW ATTACK
40 POKESID+6,252:POKESID+13,252:POKESID+20,252:REM:FULL SUSTAIN & SLOW RELEASE
50 POKE253,30:POKE254,25:POKESID+7,209:POKESID+8,18
60 POKESID+14,143:POKESID+15,12:SYS49157:REM SET PITCHES AND START VIBRATO
70 POKESID+4,17:FORT=1TO1000:NEXT:REM:FIRST NOTE
80 POKE253,49:POKE254,28:FORT=1TO1000:NEXT:REM:SECOND NOTE
90 POKE253,165:POKE254,31:POKESID+11,17:POKESID+18,17:REM:THIRD NOTE
100 FORT=1TO4000:NEXT:POKESID+4,16:POKESID+11,16:POKESID+18,16:SYS49170:END
500 DATA2,0,0,0,0,120,169,31,141,20
510 DATA3,169,192,141,21,3,88,96,120,169
520 DATA49,141,20,3,169,234,141,21,3,88
530 DATA96,174,0,192,202,208,8,162,2,142
540 DATA0,192,76,51,192,142,0,192,76,49
550 DATA234,165,253,205,2,192,208,7,165,254
560 DATA205,3,192,240,15,165,253,141,2,192
570 DATA165,254,141,3,192,169,0,141,1,192
580 DATA174,1,192,240,88,202,240,15,202,240
590 DATA12,202,240,33,202,240,30,202,240,27
600 DATA202,240,24,165,252,74,74,24,101,251
610 DATA141,0,212,133,251,165,252,105,0,141
620 DATA1,212,133,252,76,154,192,165,252,74
630 DATA74,141,4,192,165,251,56,237,4,192
640 DATA141,0,212,133,251,165,252,233,0,141
650 DATA1,212,133,252,174,1,192,232,142,1
660 DATA192,224,8,144,5,162,0,142,1,192
670 DATA76,49,234,165,253,141,0,212,133,251
680 DATA165,254,141,1,212,133,252,76,154,192,144,256
```



CLIFF HANGER

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Shoot the Rapids

AUTHOR – PAUL BUNN

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GOOD VIBES FROM SID

Line 10 and lines 500-680 provide the automatic vibrato; lines 20-100 are there just to provide a little demonstration music. With a little modification, this program will provide some rather astonishing sounds, so, if you feel inclined, have a go at it.

Using the automatic vibrato in your own music programs is quite simple. Just include line 10 and lines 500-680 (line numbers are not important but make sure that if your program includes its own READ/DATA lines that it READs the right DATA at the right time) in your program.

When you want a vibrato in voice 1, use **SYS49157**, and, instead of POKEing **SID** and **SID+1** with the pitch information, **POKE 253** and **254**. Make sure that you **POKE 254** or you will occasionally get some unexpected sounds.

Then start the note by POKEing **SID+4** just as you normally would. Turn the vibrato off with **SYS49170**, and remember that when the vibrato is off you need to go back to POKEing the pitch into **SID** and **SID+1**.

There are many ways to get a vibrato from SID. You can set voice 3 to a very low frequency, then set up a loop that POKEs **SID**, **PEEK(S+27)** (the read register for voice 3 frequency). A professional synthesizer player would say that this method uses voice 3 as a *Low Frequency Oscillator* or LFO.

The disadvantage of this technique is that it uses up voice three without making use of its sound — something to be avoided on a synthesizer with only three voices. Another way is to use the envelope and gating controls to get an intensity (loudness) vibrato, although I've never gotten one that sounded really good with this method. Maybe one of the boffins amongst you can do better.



Sidney Sawtooth plays on

You can, however, combine all of the voices to create one complex sound with an interesting intensity vibrato. The next program uses all three voices deliberately set a little out of tune with each other (detuning), ring modulation, and envelopes (ADSR's) set to different values to make a richer sound than any one voice could provide for this not unpopular folk melody:

Notice in line 110 that the pitch of voice 2 is set a little under voice 1 and the pitch of voice 3 is set a little above voice 1. This "de-tuning", along with the ring modulation in voice 3 (more about that in a later article) causes a phenomenon called "beating" which gives the effect of vibrato. Here's how.

Think of the sound waves coming out of your speaker as a series of compressions and rarefications of the air. The closer together these compressions and rarefications are the higher the pitch sounds to you.

If two pitches are being fed into your speaker, their compressions and rarefications will sometimes augment each other, and sometimes cancel each other out. If the two are very close to each other in pitch, they will augment each other and then cancel each other out slowly enough that you will hear the effect as an intensity vibrato.

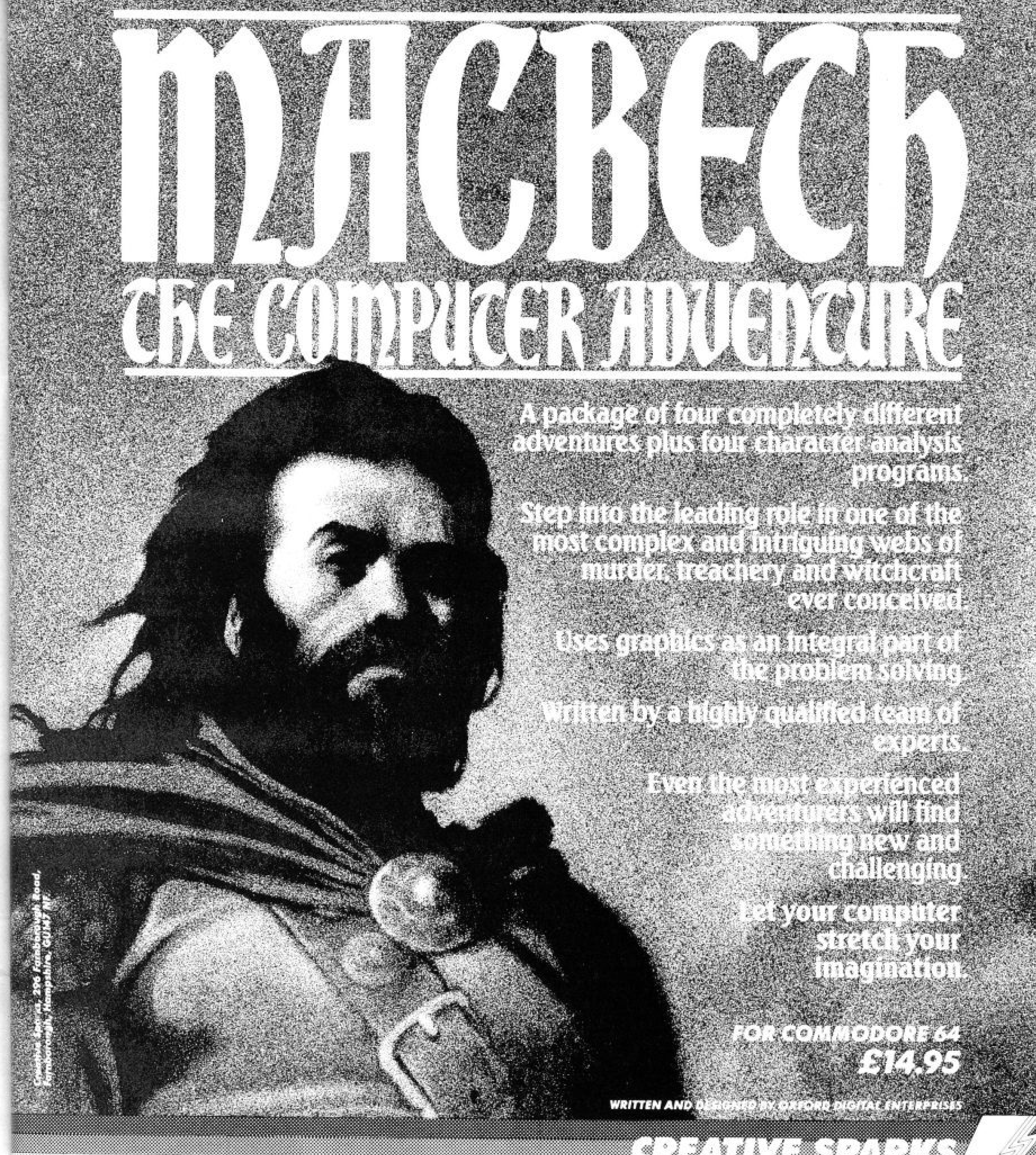
If you listen to this program through a good hi-fi set, you will probably hear four notes in each of the last two chords. No, I didn't find a hidden fourth voice in SID, although I wish someone would. When certain intervals are tuned just right, the same acoustical phenomenon that produces the vibrato in this example will give the effect of a fourth voice. Here's what happens.

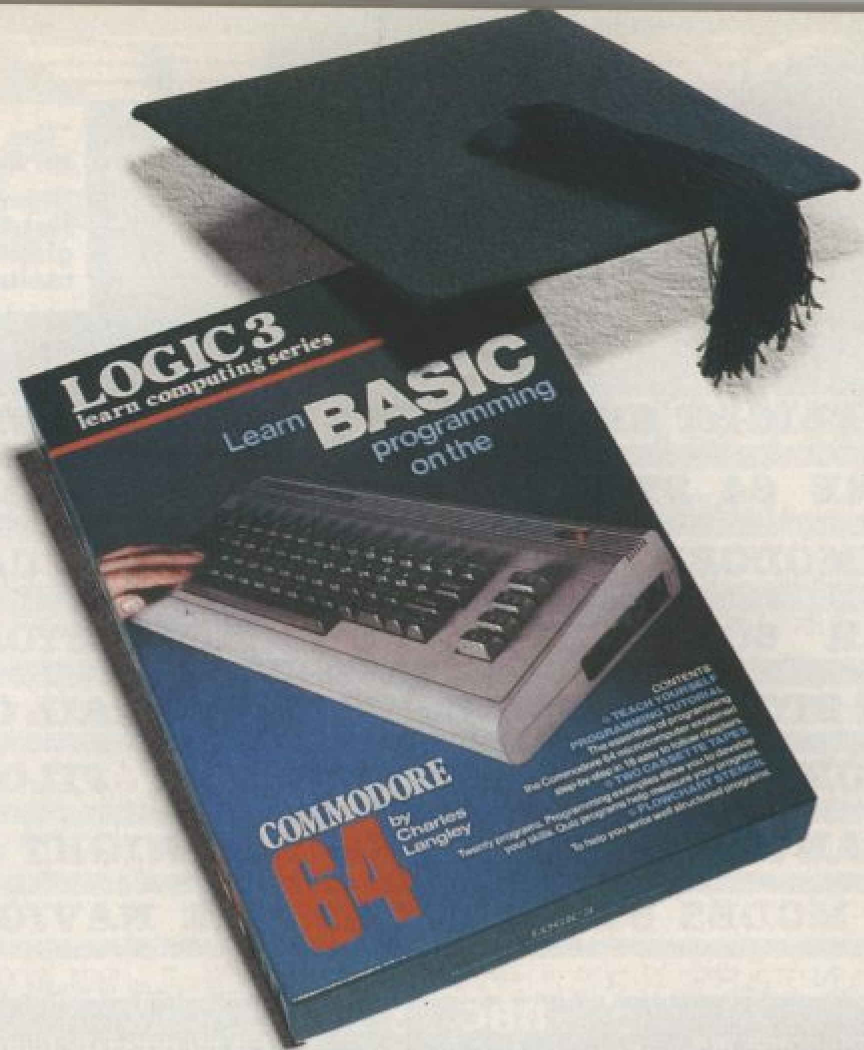
The cycle of augmented and diminished volume that produces the vibrato is itself a pattern of compression and rarefication of the air. If we speed that pattern up enough, we will hear it as a note itself instead of as a vibrato. One other thing to notice: lines 80 and 90 cause the slide effect between notes.

That's three ways to produce a vibrato on your Commodore 64 — who said SID couldn't sing?

PART THREE

```
10 S=54272:FORL=STOS+24:POKEL,0:NEXT:POKES+24,31:POKES+23,1:POKE992,65
20 POKE993,17:POKE994,21:POKES+15,18:POKES+10,8
30 POKES+5,149:POKES+12,150:POKES+19,154:POKES+6,198:POKES+13,213:POKES+20,244
40 Z=0:POKES+22,200:Y=8
50 POKES+3,2:POKES,209:POKES+1,18:POKES+7,179:POKES+8,18:FORT=1TO900:NEXT
60 READA:READB:POKES,A:POKES+7,(A-19):POKES+14,(A+19):POKES+4,65:POKES+11,17
70 POKES+18,21:FORT=1TOB*Y:NEXT:READC:READD:READE:POKES+4,64
80 POKES+11,16:POKES+18,20:FORT=CTODSTEPE:POKES+1,T:POKES+8,T:POKES+15,T
90 NEXT:Z=Z+1:IFZ=34THENPOKES+6,248:GOTO110
100 GOTO60
110 READA:READB:POKES,A:POKES+7,(A-19):POKES+14,(A+19):POKES+4,65
120 POKES+11,17:POKES+18,21:FORT=1TOB*Y:NEXT
130 POKES+11,16:POKES+18,20:FORT=1TO100:NEXT:POKES+7,62:POKES+8,42:POKES+18,0
140 POKES+14,135:POKES+15,33:POKE994,17:POKE995,17:FORT=1TO50:NEXT
150 POKES+4,65:POKES+11,17:POKES+18,17:FORT=1TO2000:NEXT
160 POKES+11,16:POKES+18,16:POKES+7,166:POKES+8,37:POKES+14,110:POKES+15,31
170 FORT=1TO50:NEXT:POKES+11,17:POKES+18,17
180 FORT=1TO1500:NEXT:POKES+4,64:POKES+11,16:POKES+18,16:END
200 DATA209,70,18,25,1,30,150,25,31,1,165,26,31,25,-1,30,26,25,31,1
202 DATA165,150,31,28,-1,49,70,28,25,-1
204 DATA30,150,25,21,-1,31,70,21,18,-1
206 DATA209,150,18,18,0,209,70,18,25,1
208 DATA30,150,25,31,1,165,26,31,25,-1,30,26,25,31,1
210 DATA165,150,31,28,-1,49,70,28,37,1
212 DATA162,380,37,31,-1,165,70,31,37,1
214 DATA162,110,37,31,-1,165,26,31,37,1,162,26,37,31,-1,165,26,31,25,-1
216 DATA30,150,25,18,-1,209,70,18,21,1
218 DATA31,110,21,25,1,30,30,25,25,0,30,26,25,21,-1,31,26,21,18,-1
220 DATA209,150,18,18,0,209,70,18,25,1
222 DATA30,150,25,31,1,165,26,31,25,-1,30,26,25,31,1
224 DATA165,150,31,28,-1,49,70,28,25,-1
226 DATA30,230
```


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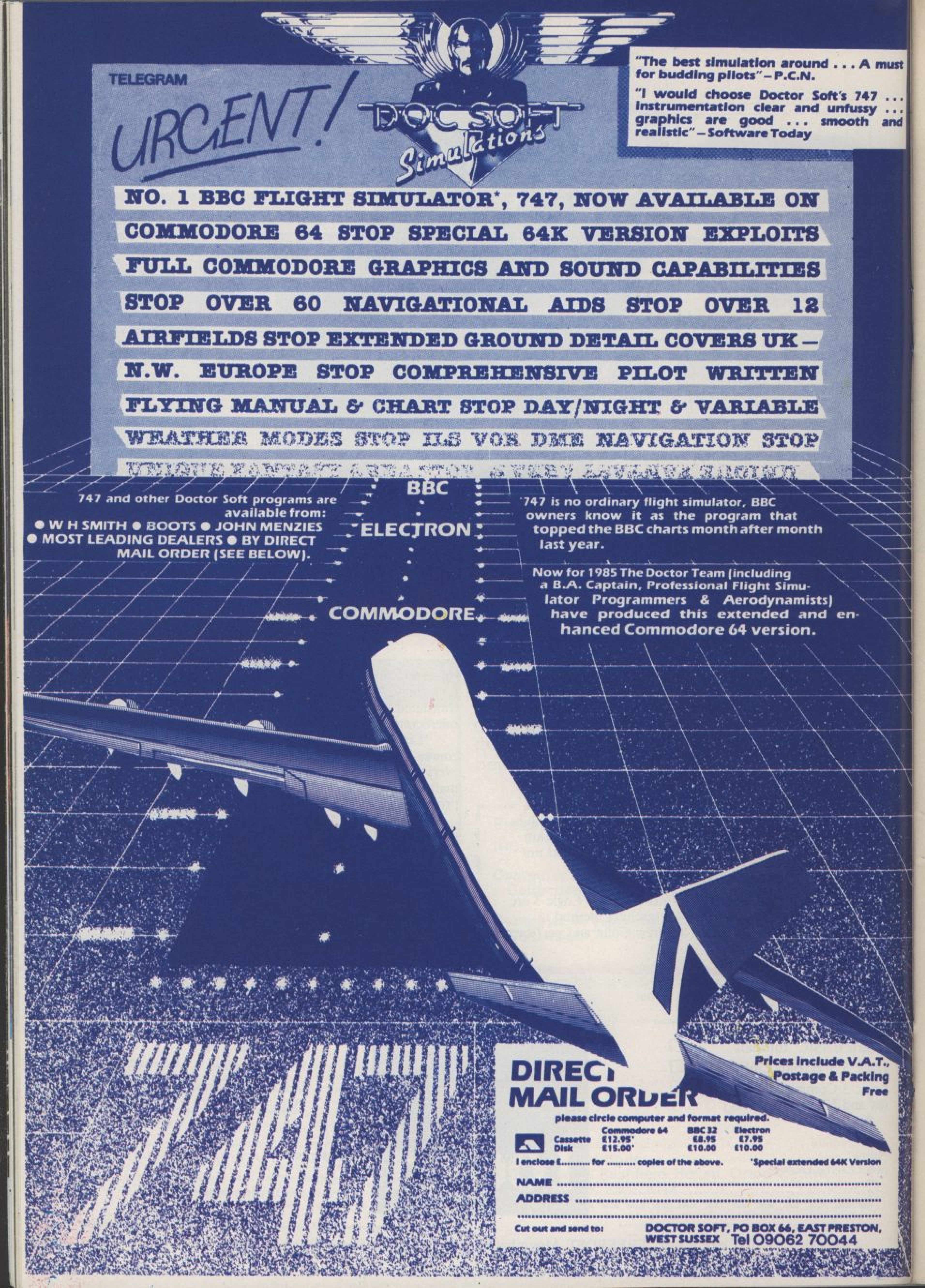
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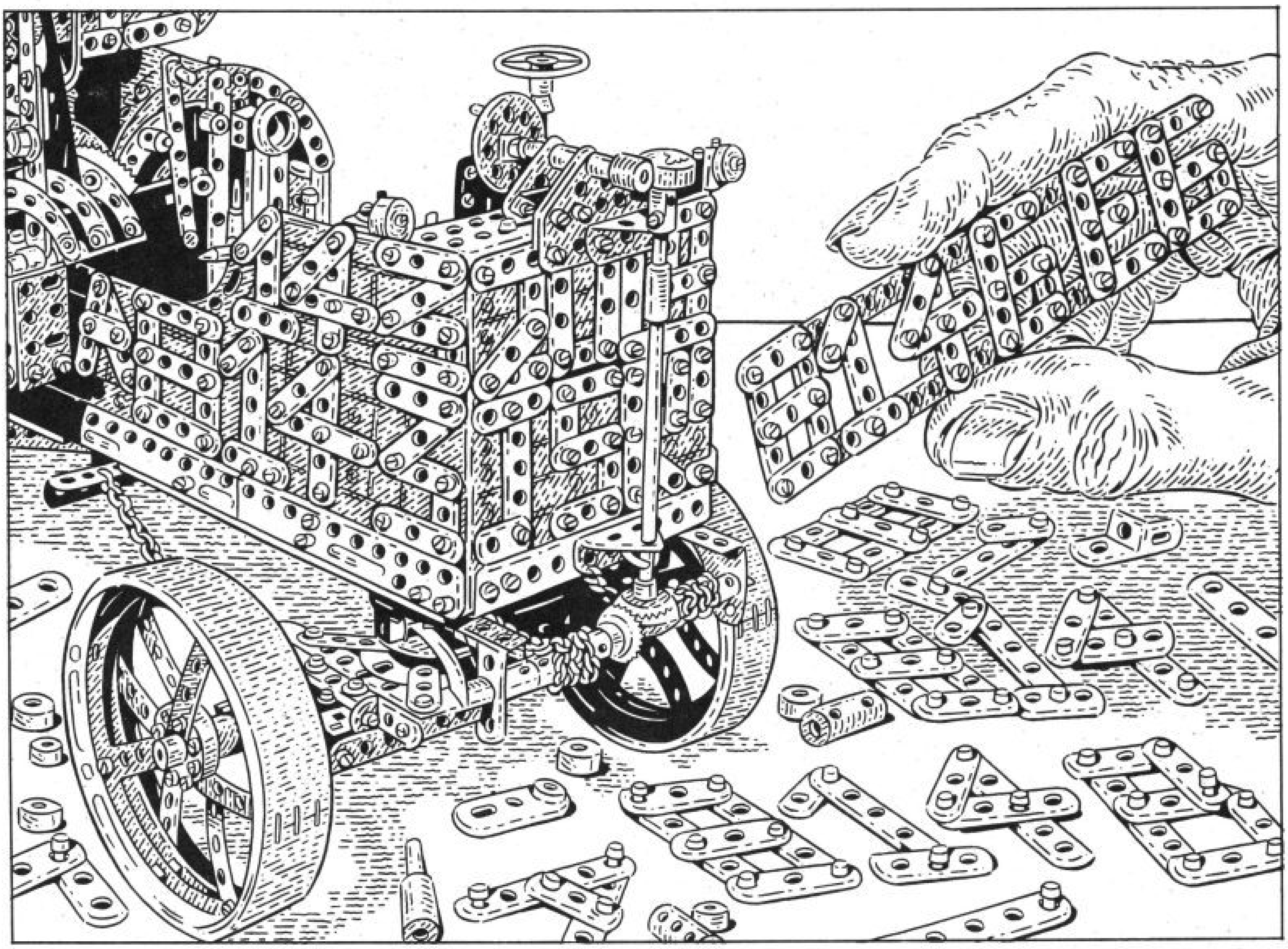
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GOING INTO ASSEMBLY

Four 64 assemblers reviewed

by Ken Ryder and Dermot Williams

There are several ways of entering machine code into your 64. You could painstakingly hand-assemble your list of 6502/6510 mnemonics into DATA statements using a Basic loader. But you could buy a machine-code monitor or, better still, an assembler. The last two methods are recommended to avoid sleepless nights. Ken Ryder has been getting to grips with Audiogenic's machine-code monitor and Doctor Watson's Beginner's Assembly Language, whilst Dermot Williams has grappled with Interceptor's Assembler 64 and Zeus 64 from Design Design.



Audiogenic Monitor

Audiogenic's Monitor, at £29.95, is the most expensive package reviewed here. It is contained in a sturdy, neat, chocolate brown cartridge. It occupies 8K of address space from $8000 to $9FFF, so the Basic program area is reduced to 30K when the cartridge is in place.

Commands

The firmware offers 17 commands — 16 enable machine code to be entered, examined and modified; the other one allows a Centronics parallel printer to be connected to the user port via a suitable cable.

Unlike the original TIM monitor found on Pets, which tends to be the starting point for designers (and reviewers) of *any* Commodore assembler, the Audiogenic Monitor boasts an assemble command (A). It accepts standard 6502 mnemonics, addressing notation and hexadecimal operands. Branching is made easy by specifying the branch address instead of calculating offsets in twos-complement.

Conversely there is a disassemble command (D) which displays the machine code in hex followed by the

equivalent mnemonics and operands from a specified start address. The disassembly stops after each screenful; either the hex or mnemonics can then be overwritten and will be re-assembled automatically.

An area of memory can be filled with the same byte with the F command, useful for setting up screen colours and displays. The hunt command (H) can search an area of memory for a text string of sequence of bytes.

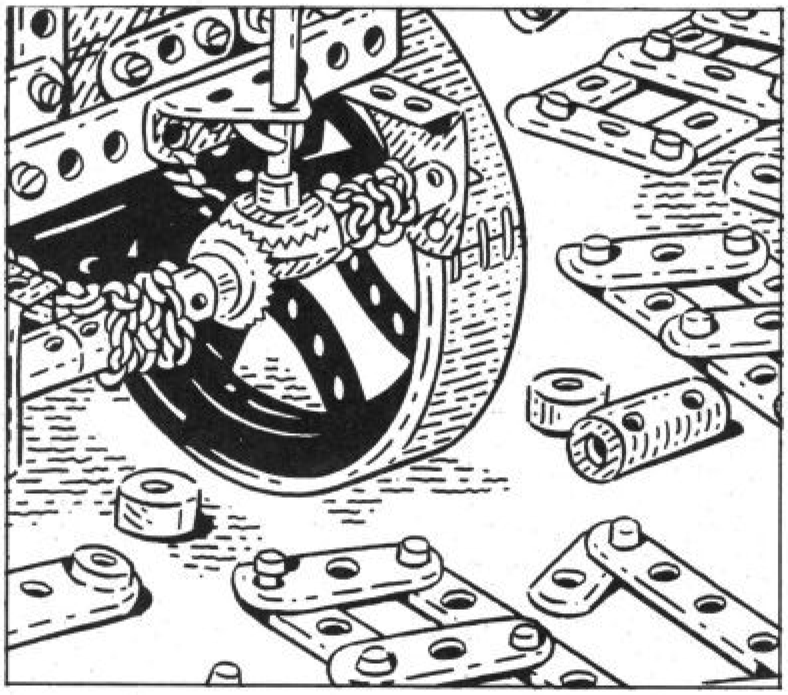
Any area of memory can be displayed as hex values shown in eight columns with the M command; the normal 64 screen editor can then be used to overwrite any particular value. In this way areas of memory can be filled with data for use by the main program. This data or indeed any other area of RAM can be transferred from one location in the 64 to another by using the T command, so code can be opened up as a program expands.

The usual G command is included to run machine code from a specified address at full speed. Alternatively the program can be stepped through instruction by instruction with the current position of the program counter displayed. In addition a 'Walk' command can step through so that at each instruction the contents of all the registers are displayed together with the hex and disassembled instruction. At any time the contents of the registers can be overwritten and the walk process continued. These last two commands are obviously useful for checking the flow of a program, and for tracing unexpected loops.

Output

Machine code can be saved and loaded from tape or disk with a filename. Unfortunately there's no 'Verify' command to check that the code saved is the same as that in memory. A disassembled area of memory may also be sent to the printer if required (with the P command).

In addition to the monitor features there is also a (C) command to connect a Centronics parallel printer to the user port. Once the command has been executed, control can be returned to Basic; and listings, files etc., can be sent to the printer in upper-case CBM ASCII or upper/lower-case true ASCII.



Conclusion

Audiogenic's offering is a fairly standard machine-code monitor with the convenience of cartridge operation and the added bonus of a Centronics printer interface provided you have a suitable cable. But the documentation is minimal, lacking detailed examples, and a beginner will need a book to refer to — Commodore's own *64 Programmers Reference Guide* should do. This monitor is aimed at the experienced user, writing relatively short code to be included in Basic programs, or to add commands to the rather limited Basic language.

Monitor — £29.95
Audiogenic, PO Box 88
Reading, Berks
Tel: 0734 664646

Dr Watson's Beginners Assembly Language

The Dr Watson assembler course consists of a tape and book presented in a library book type binder. The complete package will cost you £12.95. The tape contains an assembler and a tutor in the black art of hexadecimal.

The menu-driven assembler falls somewhere between the Rolls-Royce Mikro 64 and the Audiogenic Monitor, again occupying about 8K of RAM. It is not a true assembler like Mikro 64 where a source code is created and then assembled into machine code (object code). Instead it is a *continuous* assembler like the Audiogenic offering: it is far more flexible, though.

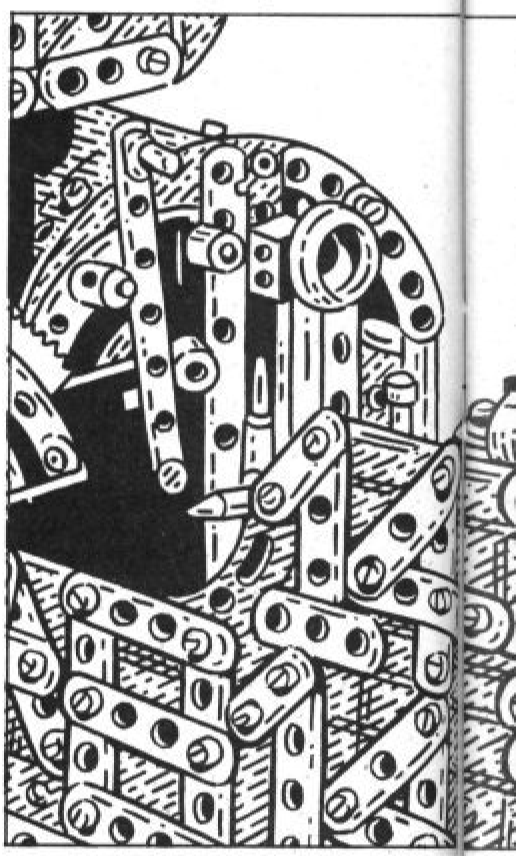
Labels are supported and operands may be entered in hex and decimal. By default the number of labels is limited to 21; but the assembler is written in unprotected Basic, and instructions are given to increase the limit by altering the program.

The assembler also includes the rather advanced feature of MACROs. A MACRO is a series of instructions which reoccur throughout the machine code — it is not a subroutine, though. It is sometimes more efficient to repeat instructions in machine code instead of calling them as a subroutine. Although this occupies more memory it can increase the program running speed. A set of instructions is identified with a MACRO name, from then on wherever that name is used the specified set of instructions is included in the code without having to type it!

Commands

Programs are entered with the usual set of 6502 instructions. Unfortunately the method of indicating addressing modes does deviate slightly from normal and would have to be re-learned when using any other monitor or assembler.

The area of memory containing the machine code, or indeed any other part of memory, may be



listed to the screen or printer; only Commodore or equivalent printers are supported, however.

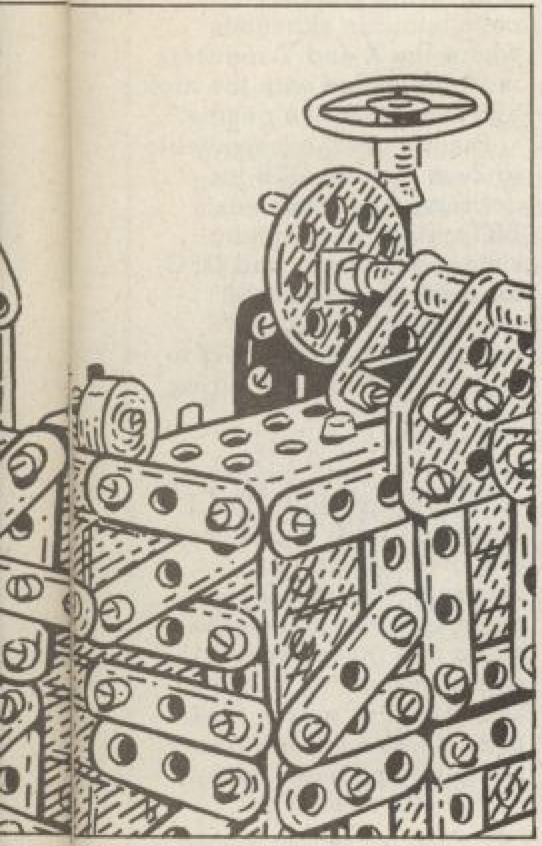
The listing is impressive — divided into three net columns. The first displays the memory address in both hex and decimal, the second shows the machine code stored in that address in hex, and the third gives the equivalent disassembled code in Dr Watson mnemonics.

Unlike the Audiogenic Monitor, the disassembled code may not be edited. The only way to alter code is to overwrite it, or enter the built-in machine-code monitor. The monitor is identical to TIM (containing the commands S,L,G,R,M,X) so the contents of memory can be displayed in hex and edited.

TIM is loaded into the $C block of memory, and remains there even if the assembler is overwritten with another Basic program. Machine code created by the assembler may be re-located elsewhere, or existing code can be 'opened up' to insert extra commands.

The book

The whole spectrum of machine code is covered in the well-written and informative companion



paperback of some 240 pages: each member of the 6502 instruction set is explained with the aid of several examples and exercises. The assembler and its functions are described too, together with methods of entering machine code without the assembler (POKEs and DATA statements).

This is where Dr Watson offers a useful option to convert machine code into Basic DATA statements, with user-definable program line numbers. These statements can then be tagged on to the end of a Basic program, or one can be written around them. The text even describes where to locate machine code to prevent it being overwritten by Basic. All good stuff.

The 64's Kernal ROM contains many useful machine code routines which can be accessed by your own code, avoiding a lot of hard work. For example characters can be read from the keyboard and output to the screen very rapidly. Lessons describing how to incorporate these routines are also included in the text. There's a comprehensive memory map of the whole Kernal ROM in an appendix, together with a map of the Basic ROM and a general map of the 64.

For the more adventurous programmer floating-point manipulation using machine code is covered. This is a complex subject, but the authors introduce it in a matter-of-fact way using the Kernal's floating point routines and accumulators to maximum effect.

In the same chapter the oft-forgotten or glossed-over subject of the Basic USR statement is introduced. This command is the link between Basic and machine code, allowing floating point parameters to be passed from one to the other. This subject deserves and receives a clear explanation.

Conclusions

Dr Watson's assembler is fo the complete novice and is suitable for the development of short-to-medium-sized programs. The accompanying text book is excellent, written in a relaxed and friendly style and certainly very specific to the 64. Verdict? Excellent value for money.

Dr Watson's Beginner's Assembly Language — £12.95
Honeyfold Software
Standfast House,
Bath Place, High Street,
Barnet, Herts.
Tel: 01-441 4130

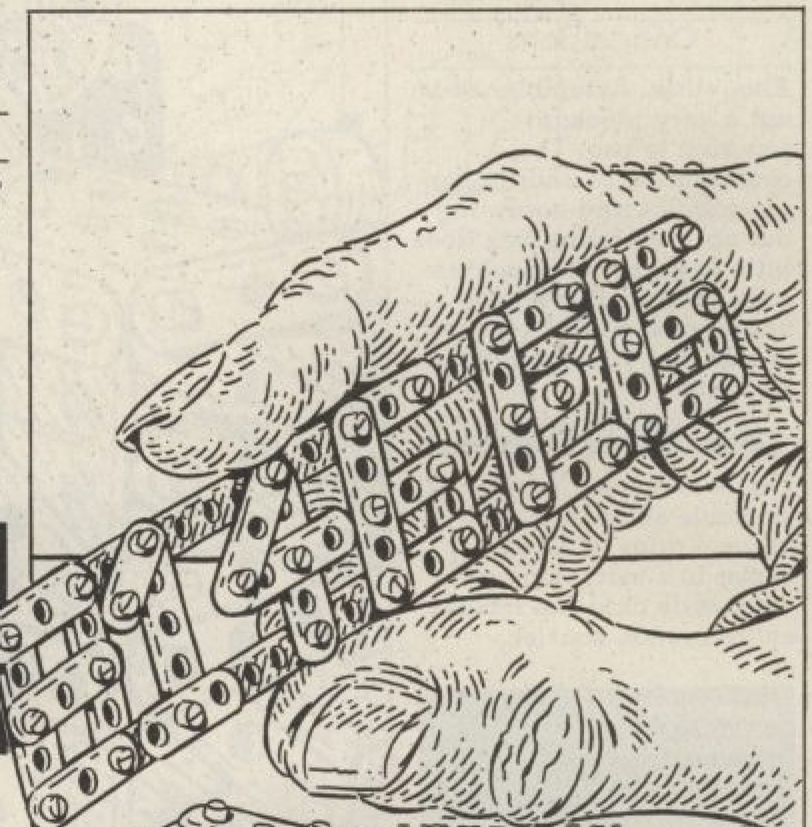
Interceptor: Assembler 64

Assembler 64 costs a mere £7 — and the price shows. It comes in a small plastic cassette case just like one of Interceptor's games. That means the instructions are crammed on to the tiny inlay card. Whilst this is ideal for games, it's hardly suitable or adequate for a complicated utility such as an assembler. Incidentally, it is not available on disk.

The assembler allows Basic-like source files to be entered with mnemonics preceded by line-numbers and arranged in order accordingly. Apart from standard mnemonics, lines may contain labels, line-number branches and BYTes.

Labels may be substituted for numbers in all situations, and simple addition may also be performed. Line numbers may be used in place of absolute addresses or labels as long as the line number is preceded by the letters 'GO'. For example, 'BNE GO100' means BNE to line 100 of the source file.

The only pseudo-operand is BYT. It is used for inserting numeric data into a program. So BYT 67,85,33 would insert these three numbers into the object code. Note that BYT, and indeed all other mnemonics, accept only decimal numbers. This will obviously slow down a practiced hex programmer.



Commands

However, Assembler 64 does provide two base-changing commands: DEC and HEX. Or does it? Whilst DEC happily converts decimal numbers into hex, I couldn't get HEX to perform the opposite function. That probably means that when writing programs with Assembler 64, you can neither insert hex into your work, nor get the program to convert hex into decimal numbers that it has already accepted.

Source programs may be edited much like Basic programs with lines being edited, added, deleted, inserted and listed. Listings may be directed to both the screen and a (Commodore) printer. And source files may be loaded and saved, with both tape and disk being supported.

Once a source program is complete, the ASSEMBLE command begins the assembly process. But it's a slow three-pass job which

assembles directly into memory. And there is no option for saving the object code.

But Assembler 64 imposes a few infuriating deviations from standard 6502/6510 mnemonics: all commas in indexed addressing must be replaced by semi-colons. If you're used to commas, it's difficult to stop them slipping in. Also, and for no apparent reason, absolute numbers must be represented by the 'equals' sign; for example, LDA = 10 or CPX = 255.

Conclusions

Altogether, Assembler 64 is not a very pleasant program to use. The combination of unorthodox mnemonics and accepting but not converting hex does little to make the machine-code programmer's lot a happy one. Still, £7 is very cheap, but you could do a lot better.

Zeus 64 Assembler

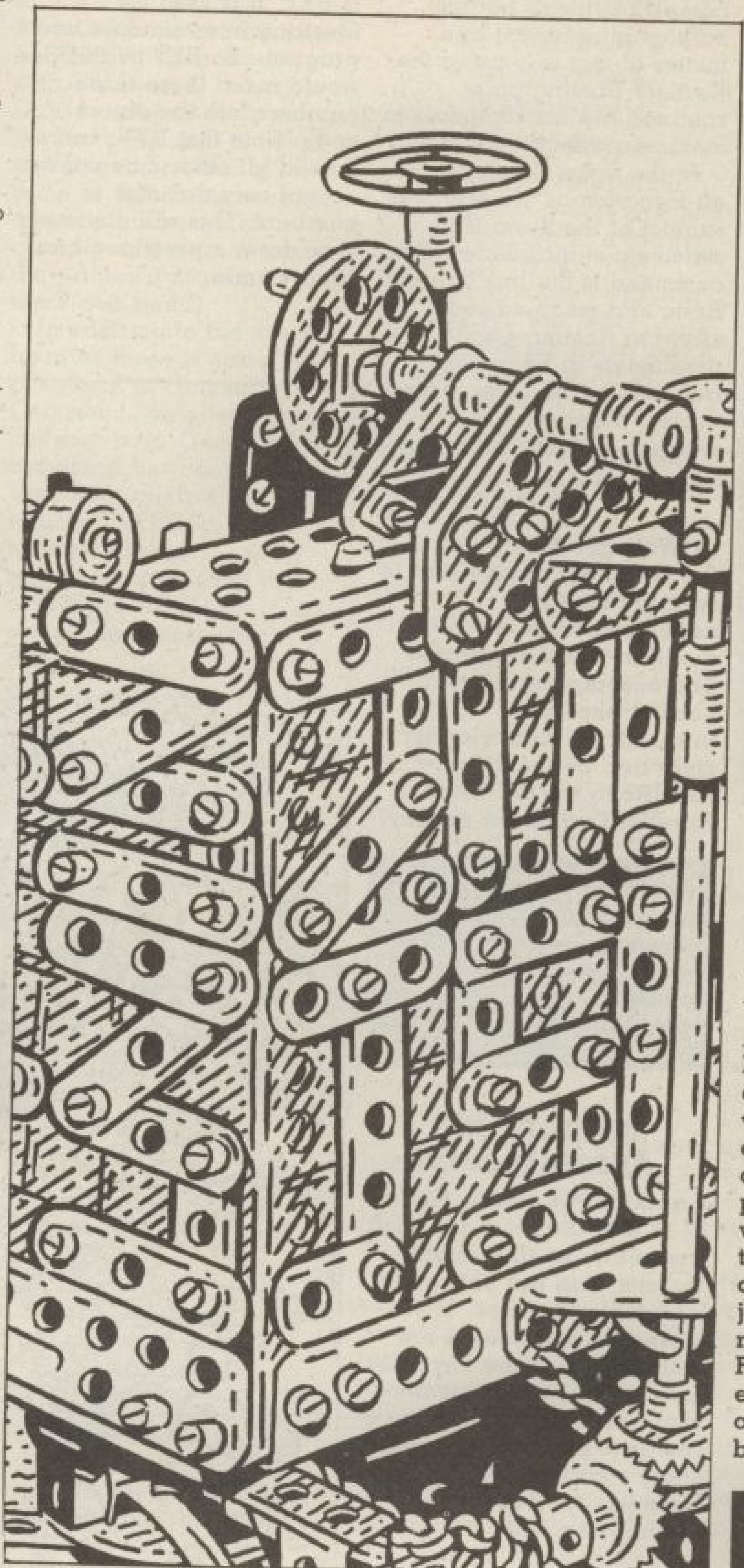
The Zeus monitor is also available at a potentially bargain price — £9.99. It comes in a more impressive video-style case and includes an instruction booklet.

Assembler 64 — £7
Interceptor Software
Lindon House,
The Green, Tadley,
Hants.
Tel: 07356 71145

The monitor

On loading, Zeus jumps straight into the machine-code monitor, and with nineteen commands, it's pretty powerful. There are the usual monitor commands, such as D (disassemble), F (fill), G (execute code) and R (registers). Then there's the not-so-usual and very useful commands like T (tabulate) and C (copy), which accomplishes the 'transfer memory' function.

The T command itself gives a tabulated display of memory contents in hex, eight bytes at a time just like the normal monitor M command. In addition to the hex display, an ASCII display of memory can also be given. This is a real bonus when you're writing programs that involve a lot of text. Then there's the P command which directs output to a printer, not just a Commodore printer but any Centronics printer.



The assembler

Now to the assembler, which introduces itself by letting you open either a new or old source file. Of course, you can only re-open an old file if you can remember where it is in memory. The default address for source files is the start of user RAM.

Like the Interceptor assembler, Zeus creates source files ordered in Basic-like lines. But Zeus is more sophisticated because it tokenises mnemonics, thereby saving a lot of memory when storing source files — which also speeds up loading and saving to tape or disk. It also offers automatic line-numbering which works like the AUTO command found in some extended Basics. It also has a command to renumber the source file.

Zeus is very flexible in that it allows numbers to be expressed in decimal, hex or binary, as well as in mathematical equations. Labels can also be used, and ASCII directly included, with 'C meaning Commodore ASCII and &C meaning true ASCII. The 'up arrow' symbol represents high-byte, thus saving a lot of calculating in situations where the X and Y registers must be loaded with the high and low bytes of a number.

Pseudo-operands available in Zeus include DFB for defining bytes (same as BYT), DFW for defining sixteen-bit words, and DFC, for defining a string of characters. These, and others, make it very easy to include numeric and string data in program.

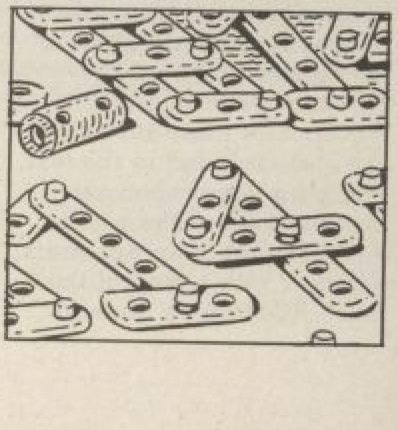
A number of useful commands are provided for editing source files. The F command finds occurrences of a given string in a program. And the C command will change the string to a given second string. As well as loading and saving of source files, Zeus allows a second source file to be appended to the end of one already in memory.

Actually assembling a program is very speedy and takes a matter of seconds. Any errors in the source code are listed along with an appropriate error message.

Conclusions

I could say a lot more about Zeus 64's features which I haven't even explored to the full yet. In all, this is a very professional package which has all the little touches that make an assembler a joy to use. For just under a tenner, it is, in my opinion, a giveaway. For someone looking for either a good monitor or assembler, Zeus has got to be a sound choice.

Zeus 64 — £9.95
Design Design
125 Smedley Road
Cheetham Hill,
Manchester
M8 7RS
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Castle of Terror is a stunning graphics adventure game set in the 1990's when and where 'Dracula' stories abounded.

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Penetrator, the most challenging arcade game has enjoyed tremendous success and now it has arrived for the Commodore 64.

Review of Spectrum 48K Penetrator.

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TEACHER INVADERS

Can software really help teach your kids?

Why did you buy a Commodore 64 for your children? Are you worried that they use it mostly for playing games? If you've asked yourself these questions, you're probably the kind of person educational software producers would like to meet. The education market is growing rapidly, gradually convincing us that with appropriate software, your zapping-machine can become a valuable educational tool. Ken Young takes a broad look at ideas behind educational software and samples some of the most recent offerings for the Commodore 64.

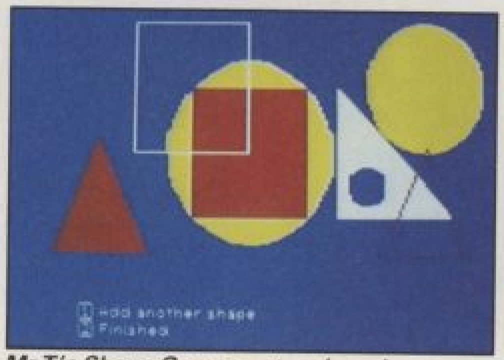
by Ken Young

Practically every micro manufacturer on the market has at some time or other made the claim that their product has untold 'educational' potential. This has led to many parents buying computers with the sole intention of using them as a kind of hi-tech replacement for that old mainstay — the Encyclopaedia Britannica.

The dream of little Johnny sprouting untold amounts of new grey matter as a result of a few nights alone with the all powerful grey box has proved to be more than wishful thinking. But this is by no means a cause for despair. It is a most healthy development. In the short term the suppliers may sell less computers for 'educational' reasons; but in the long term there will be more and more educationally valid programs on the market and less and less utterly mindless 'drill and practice' type software that should have been thrown out long ago along with thermionic valves.

The Commodore 64 is in a particularly good position to benefit from the past 2-3 years of experimentation by software houses in the education market. Many programs that have proved to be successful on the preferred schools computers — the BBC Micro and the RML 380Z — are being converted for the burgeoning home computer market where the only real chance of making a profit from educational software lies.

There's no denying that home computers are educational; they give an insight into the workings of computers at all levels; they encourage logical thought; they offer openings to an ever-widening variety of stimulating micro-worlds. But like all tools their usefulness depends on the intelligence and integrity of the user.

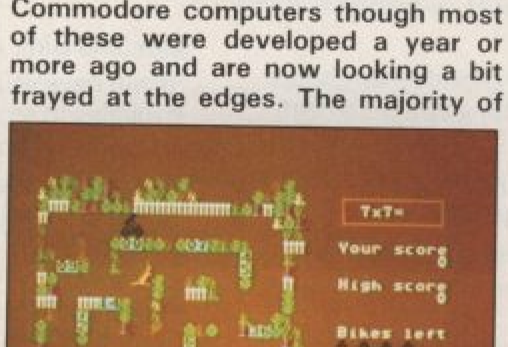


Mr T's Shape Games — teaches shape recognition.

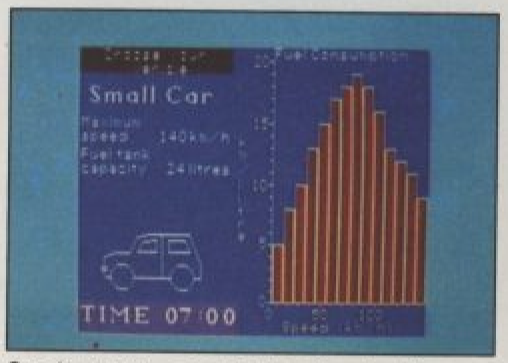
The secret to getting educational value out of your computer lies in keeping your expectations to realistic levels; don't expect the computer to replace a good teacher — that won't be possible for another 20 years or so — but do expect it to be an invaluable addition to learning techniques already available.

So what kind of programs are there on the market and who are they aimed at?

There's around about 200 programs of an educational nature for Commodore computers though most of these were developed a year or more ago and are now looking a bit frayed at the edges. The majority of



BMX Number Jump — bike fun teaches arithmetic.

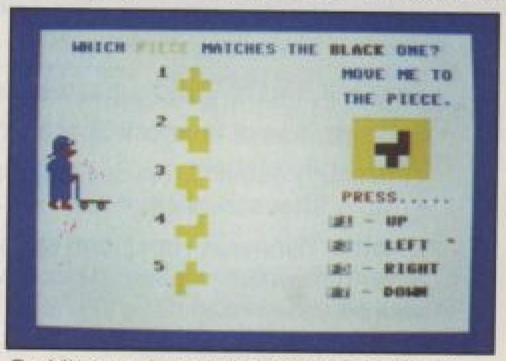


Car Journey — good educational software.

programs are aimed at the under-12 year old age bracket mainly because programs for older kids are difficult to write and expensive to develop.

The programs to avoid are the computerised tests that make little use of graphics or sound facilities — thankfully these are disappearing fast. A more common trend, particularly for programs for early learners, are packages based around a household character such as Paddington Bear. Another technique is to make learning as much fun as possible by introducing a strong game element as is the case with 'BMX number jump' in which the player races a BMX bike over mathematical hurdles in a frantic attempt to become an ace rider.

Perhaps the most interesting development of all, and one which has all the signs of a continued healthy growth, are the simulation



Paddington Bear is the star of a series of educational games.

programs that let the child experience a real situation and have to make a whole range of decisions to achieve success in the game.

Teachers claim these programs are extremely good for 'cognitive' development. The kids just say it's a whole lot of fun. But enough about the theory; let's load up some of the most recent offerings for the Commodore 64 and assess their suitability as educational software.

LEARNING FOR TINY TOTS

Collins Software have come up with a very attractive range of packages that

neatly supplement the best selling Paddington Bear books. The programs are reasonably priced at £7.95 and consist of a short story book, separate loading instructions and computer cassette.

Each program addresses particular needs of early learners such as writing skills and perceptual ability. This is done by use of a number of programs on the one cassette that neatly dovetail to provide many hours of enjoyable learning.

Paddington And The Disappearing Ink is to be highly recommended. It begins with a program called *Letter* that is the best implementation of word-processing for young learners I have ever seen. The child is asked to type in his or her name and is then helped to write a letter; the computer asks for the address line by line and neatly slots it into the relevant position on the screen. Ways of beginning or ending the letter are suggested to add to the child's use of the language.

Letter is complemented by *Typewriter* which takes the child a little further and offers the choice of writing a thankyou letter or a 'having a nice time' holiday letter. There are plenty of prompts to encourage different approaches: such as five different suggested ways of describing the weather — now there's the mark of a British software house.

Another program, **Paddington's Problem Picture**, begins by asking the child to help our cuddly hero match up shapes on the screen (circles, squares, diamonds etc.) It includes colourful, clear graphics and musical rewards when the child successfully manoeuvres Paddington and his trolley to the correct shape.

To help reinforce the use of the words describing different shapes the next program on the tape asks the child to guess the correct word to describe a particular shape; each error builds part of a train, which after ten mistakes shunts off and chunders its way across the screen. The sound and graphics will be the envy of British Rail.

Further programs help the child to differentiate between colours and to sort shapes according to shape and/or colour.

The cream on the cake is the final program called *Mosaics* which lets the child design his or her own drawings on the screen. It's a matter of moving a 'tile' around the screen, selecting a shape, and after dipping the shape into the colour required, placing it on the working area of the screen. It's an excellent simulation of computer aided design and could easily have been sold as a program in its own right.

Good Housekeeping Software have adopted a similar approach with the creation of their **Mr T Software**. Mr T is less 'T'angible as a character but his lively T-shaped body appears giving help and assistance throughout. The range is now being expanded, with each package costing £9.95. Here's two of the latest offerings:





Mr T Tells The Time consists of four different activities which encourage familiarity with clocks. The first, *Matching Hours*, shows a clock presented gradually on the screen. Hourly times are automatically indicated along with melodious bell chimes. Subsequently the child is asked to match the positions of the hour hands on another numberless clock. On successful completion Mr T shows his approval by showing off his breakdancing skills — definitely better than a tick in the margin from teacher.

Then there's *Clock Numbers* which helps the child learn to place numbers around a clock face. And *O'Clock* brings the activities together by asking the child to move the hands of the clock to the correct positions for different times.

Mr T's Shape Games is all about recognition of different shapes — the child has to estimate if a falling shape is going to fit into a larger pattern on the screen and press the space bar when it is in the right position. It requires great attention and good timing. *Shape Maker* is a little more relaxing, allowing the child to select shapes and colours and to create pictures on the screen.

All the Mr T programs are very 'user friendly' and are easy to modify for children of different abilities. They come complete with a helpful Parents Handbook with full details about each program and lots of hints and tips for setting up related activities. These programs are to be recommended but you must be prepared to be very involved in the process of using them with your kids.

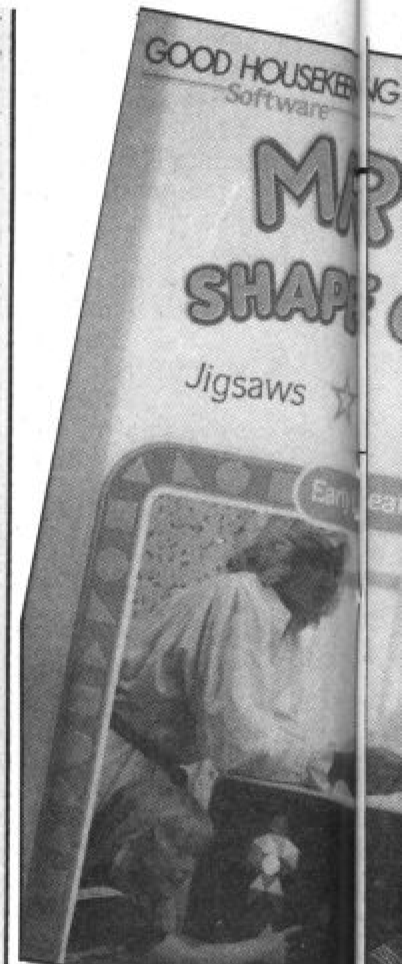
Clever Cloggs (Argus Press, £6.50) is a series of six different early learning games. One of them is titled 'Party Time for age 3+'. It has its moments: it begins with an invitation to the child to be the 'Clever Cloggs' at a party. The six games involve activities such as keyboard familiarity, matching shapes, counting and sorting. The games are somewhat primitive and of limited educational appeal. To make life difficult there's no easy way back to the menu once you've started.

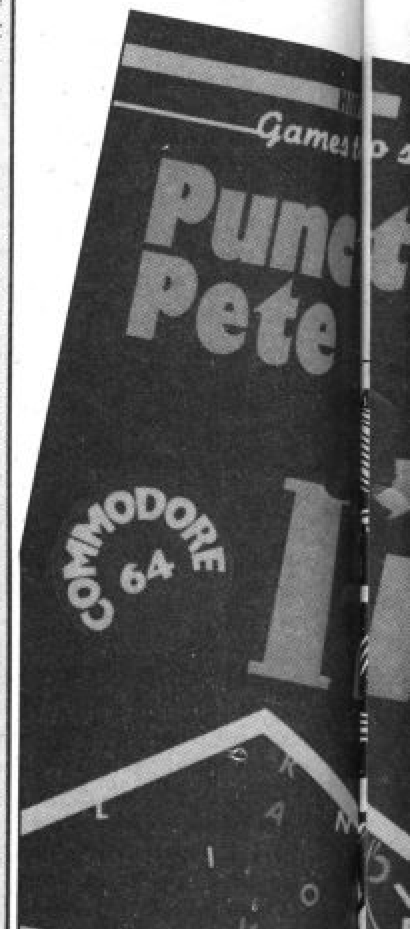
This program would get the big 'no-no' from most teachers and has little of merit except for its low price.

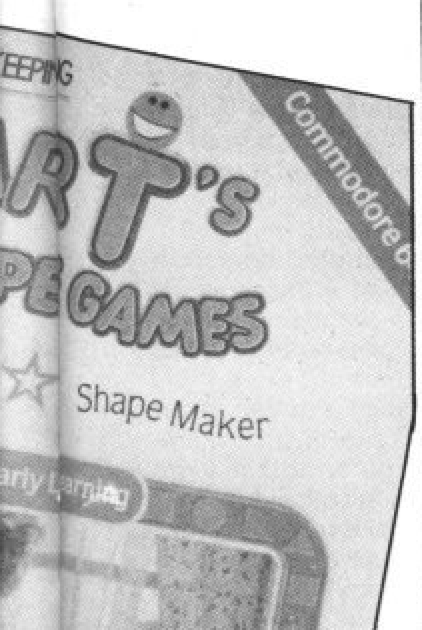
Following the theme of the cuddly cousin comes **Get Ready To Read With BJ Bear** (*Commodore* £11.99). It's an extensive, ambitious package designed by specialists in the field of early learning, aiming to introduce 3-5 year-olds to the initial stages of reading.

There is a total of four programs each containing ten different 'activities'. A colourful BJ Bear Book with stories and games backs up the on-screen action as well as a Parent's and Teacher's manual consisting of full instructions and progress record sheets.

Unfortunately the program relies









quite heavily on the use of the '*Magic Voice*' add-on unit which increases the cost by another £49.99. Commodore claim that the Magic Voice will be available in time for Christmas and that a range of other programs which make use of its speech capabilities will follow. Those activities that do not utilise the add-on are very useful and centre around recognition of words, sounds and individual letters.

There is very little on-screen help (whatever happened to BJ Bear?) but the package is very carefully put together and is educationally sound. Parents and teachers will appreciate the fact that the computer automatically records the child's progress and an overall summary can be viewed at a moment's notice.

LEARNING GAMES FOR 7-12 YEARS

In these days of the BMX bike boom and hi-tech mania, it's only natural that the games used to teach basic skills reflect the more exciting youthful pursuits — real or imaginary.

BMX Number Jump (*Longman* £7.95) is a lot safer than the real thing with the added bonus that basic number skills are learnt before saddle soreness even gets a mention.

The object is to move the BMX rider around a set of maze-jumping hurdles as he goes. Only those hurdles which contain the solution to a maths problem can be attempted. It's certainly no stroll in the park, and life is not made easier by a less than friendly kangaroo whose sole aim is to box you soundly off your bike.

There's flexibility, in that different types of mathematical work can be selected at the beginning of the game: addition; subtraction; multiplication etc. However, the game itself is painfully slow and there's no automatic way out of a game if you fancy a change or want to hand over to someone else.

3D Hypermaths (Longman £7.95) is aimed at the child with definite Luke Skywalker inclinations. The child is placed at the controls of a rocket plummeting through the hypersphere. His aim is to keep on track by avoiding obstacles. Of course the child must solve maths problems at the same time by adjusting the flight speed accordingly.

This game is easy to learn and well designed and should prove supportive to maths work at school. My only worry is that such programs are very much aimed at capturing the imagination of the boys and has limited appeal for most girls.

Word Wobbler (*Longman* £7.95) is a spelling game requiring considerable dexterity in avoiding word-wobbling aliens whilst collecting the letters needed to make up different words. The game has a word bank of 1500 words which are divided up into five difficulty levels. It is possible to





modify the lists by inserting your own words.

The sound effects are suitably menacing and the game easy yet fast-moving enough to be very addictive. Word wobbler will be a favourite at home and school.

Puntuation Pete (*Hill MacGibbon* £9.95 is surely the most endearing program around. It features Pete the Punctuater whose animated form runs around the screen helping the child with sentence construction. He boots lazy letters into capitals; slips commas into place; and gently drops full stops in at the end of sentences.

To begin with, the child must try to correct a short piece of text. Once complete, Pete walks around the text (the animation is superb) pointing out where mistakes occur. After giving three chances to correct again, Pete then runs around the screen to do the final corrections — no effort spared for the sake of correctness.

The level of difficulty can be selected — it runs from junior scribe to super scribe — and a number of different passages can be selected. Unfortunately new ones cannot be created.

Another program called *Wordfinder* is also included. It allows children to investigate connections between words and to search for similars. Words are presented and a mini database of related words can be scanned. This Thesaurus of words can also be dipped into whilst playing the anagram and hangman games included. It's an excellent way of illustrating how a database might be used. To complement the program the suppliers include an immaculately produced booklet with background information on the history of the written word and printing, ideas on writing a story, and games to play.

Fun To Learn (*Shards,* £5.95) is a pot-pourri of learning games: counting against the clock; a hangman type wordgame; an adding game; guess the word against the alien; codebreaking.

On paper it sounds impressive but the games are rather dull and unimaginative and are unlikely to stimulate a child's mind for very long.

Facemaker (*Commodore £5.95*) is a particularly imaginative program encouraging an open-ended approach to learning from parent and child.

The child is able to use the computer to build up a face based on descriptions that he feeds in. Bit by bit the face is created like a police identikit according to the descriptions given.

The creators have put plenty of effort into making the program as powerful as possible; you can even specify the type of hat to be worn, the length of hair, and whether or not an earring is worn. Such a program can happily be used by a child alone or a whole family group. It will take a long time before the interest in Facemaker wears off.

SIMULATION SOFTWARE (8 YEARS UPWARDS)

There's no doubt that simulation software gets the biggest 'thumbs-up' from teachers (some even say they get the children too motivated) and go down equally well at home.

Typically a simulation program lets the child take part in a simulation of real-world events making all the necessary decisions and taking the consequences of those decisions as well.

Special Agent (*Hill MacGibbon,* £9.95) involves the child in a rapid-fire chase around Europe in search of a killer spy who is gradually anihilating British Agents.

The secret to the game lies in consulting on-screen timetables of flights and rail departures and moving rapidly from city to city decoding secret messages that hopefully lead to the capture of the enemy.

All the excitement of foreign travel and the unravelling of a constant stream of messages leave the child totally unaware that he or she is actually learning some very useful skills: dealing with timetables, European geography, translation.

The booklet included is an excellent addition with stories about spies, maps of Europe, and other games to play. It's well designed and attractively colourful.

Ballooning (*Hill MacGibbon,* £9.95) is for the more aeronautical at heart. It simulates the flight of a balloon over various terrain and teaches a simple understanding of air flight. Unlike many programs it does not expect you to develop the skills required overnight. Instead, you are given the option to practice or go on a test flight before attempting a full mission.

The screen consists of a small balloon and the outline of land, which as you take flight, scrolls from left to right across the screen. The flight of the balloon feels very realistic and needs plenty of effort to control properly — too much thrust and you're forced into the heavens, too little and you crash to the ground below only to be welcomed by a rather touching RIP sign.

Your son or daughter won't become British Airways pilots overnight, but it's a whole lot of fun and bound to please. Incidentally, a teacher recently told me that her class had so many ideas from using this program that she had to abandon all other work for two weeks.

Car Journey (*Hill MacGibbon,* £9.95) puts the child in the position of being the owner of a delivery service, delivering parcels and packages throughout the country. In true simulation style the child constantly has to make important decisions: what kind of car or van to buy, what contracts to take, what routes to take, what speed to travel and so on.

There are a range of screens that can be viewed at any time (this 'windowing' effect is at the forefront of much business software) showing current road position, state of the bank balance, distance and fuel progress charts. Once again the enclosed booklet is well produced and contains a range of background information and further ideas.

The only failing of Car Journey is that it's too addictive. You and your child will be hooked from the word go and you're unlikely to get anything else done for a good few hours. You'll be learning a great deal in the process too. And that's probably the essence of good educational software for youngsters

• Next month, we'll be looking at educational packages for the older youngster — the range of 'O-Level' revision courses from Longman software.

COMMODORE 64 OXFORD PASCAL

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Cassette version (resident compiler only **£19.95**

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REAL ARCADE ACTION! FROM JETSOFT



Cavelon II Can you destroy the wicked wizard of castle Cavelon? Only after negotiating the six levels in his castle. Collect all the door pieces before you can attain the next level. Help is at hand in this all thrills, all action, real arcade game, when excalibur appears, achieve indestructability.



Quari

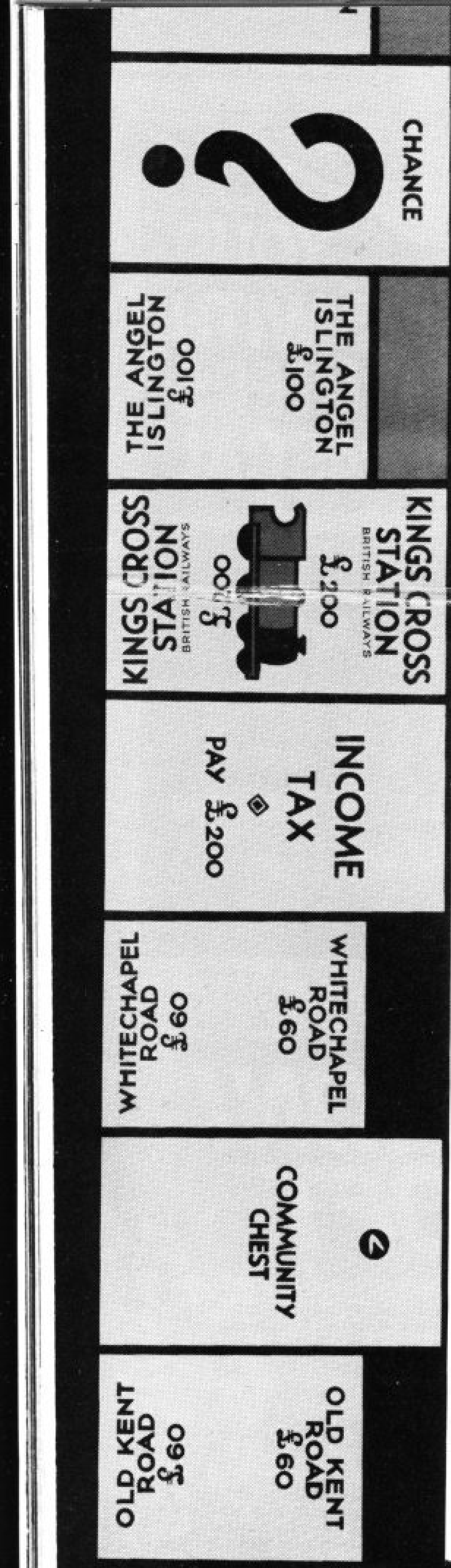
27 levels of increasingly difficult real arcade action. Based on the game Bongo, you must avoid the chasing dinosaur, pterodactyls, falling rocks, native spears and bouncing Bongos. Negotiate rope bridges and erupting volcanoes, picking up the treasures of a lost civilisation as you go – and finally cage the dinosaur – if you can!

BMX STUNTS

BMX STUNTS Based on the original arcade game this action packed game challenges your skill over six tests, straight race, wheelie, ramp jump, slalom, bunny hops and the ultimate test over a V.W. beetle in the Beetle ride.

the arcade people JetSoft

061 775 0333



No

A review of Commodore

When you've got bored with your tea chest full of shoot 'em ups or your latest mega-screen adventure, you might cast a longing eye over those old favourite board games like Monopoly, Scrabble, Othello, draughts and Chess. Remember them? If you're a board game nut, you'll be pleased to hear that all these hardy perennials can now be played with the Commodore 64. Jennifer Goldsmith has looked at what's available, some commercially, some for free.

Scrabble

Scrabble is such a popular word game, it needs no introduction. Now, a computer version for the Commodore 64 from Leisure Genius is available at £12.95. Whether you buy the tape or disk version, Computer Scrabble comes attractively presented in a pleasantly illustrated box with a 16 page manual.

Getting started

When loaded, Computer Scrabble displays a miniature yet otherwise identical version of the original board. Computer Scrabble then asks a few questions like the names of the players and whether you want the computer to play. Then you are ready to go.

Like the original, a maximum of four players can take part whether all humans, all computer or a mixture of both. All the rules of the game are incorporated in Computer Scrabble and they are explained in the manual.

When it is your turn you can select one of the nine options displayed on the screen. These are *quit, pass, premium, values, tiles, change, juggle, hint* and *swap*. *Quit* allows you to leave the current game and asks you if you would like to play again.

Pass allows you to miss your turn which you would do only if you could not make a word and there were no tiles left to do a swap. *Premium* tells you the value of the different coloured squares on the board whereas *Values* shows you the numerical value of the different letters of the alphabet.

Tiles indicates how many Ds (for example) there are left, the total number of tiles remaining is indicated under the player's scores. *Change* lets you change certain tiles in you rack but juggle alters the order of the tiles in your rack. *Hint* helps you if you cannot think of a word and *Swap* lets you swap racks with your opponent.

So in fact you have more features available to you than if you are playing the original game. One point, though, if you don't want your opponents to see the letters you're working with, they'll have to turn a blind eye whilst you inspect your set.

Conclusion

Computer Scrabble can produce hours of fun whether for one person playing against the computer or a family evening's entertainment. And at least the dog cannot walk across the board and upset the tiles! One reservation, though: the tape version of Scrabble takes about fifteen minutes to load. You could have almost played a game in that time.

Colossus

Colossus, from CDS Microsystems, is one of a number of chess programs for the Commodore 64 but claims to be the best, aiming to meet the demands of keen chess players whether they're beginners or geniuses playing blindfold. The program comes on tape (£9.95) and disk (£12.95) both of which are attractively presented in a video-style case with a sixteen-page pocket-sized manual.

Getting started

Loading Colossus takes about two minutes from disk, and about four times as long from tape. By that time, you could be well into a conventional game. Still, the board is cleanly displayed with excellent graphics for the pieces; conventional algebraic notation is displayed around the border. The move which Colossus is considering is indicated to the right of the board. You can change the colour of the white squares and the border to suit your preferences.

By pressing the space bar a second screen appears showing the elapsed times for white and black, the seven last moves, the number of plys (half-moves) ahead Colossus is thinking, number of positions examined, the best line of play found so far and the score. The latter is divided into material and position.

The score which relates to material is fairly simple to comprehend. For example, a pawn down is represented by −1. However, the score which relates to position is not calculated in decimal or 'pawns' and a large plus figure should mean that you have a large positional advantage and so on. But I don't think this is always the case: when you mate your opponent the score gives you a large material advantage, (62) and a *minus* figure for position!

Playing the game

To enter moves you can either



dice !

board games for your 64 ------ by Jennifer Goldsmith

use the cursor or the algebraic notation, providing you remember to SHIFT the letters. Both methods are clearly explained in the manual. If the move involves promoting a pawn, Colossus will ask 'Promotion piece?'. Colossus is familiar with the 3-fold rule, 50-move rule and Stalemate as well as with Checkmate.

The level of difficulty at which Colossus will play is determined by the time allowed per move or per game. The First mode lets you play 'Tournament style'. That means X moves have to be played in time Y followed by a secondary parameter of A moves in time B. The Average Mode asks the time per move. This can be anything from one second a move to 59 mins 59 seconds a move. So it's useful in lightning chess (ten seconds a move) and for analysis.

Mode three needs the time for the total game, useful for playing five-minute chess. Mode four makes Colossus play at the same rate as you. Then there is the infinite mode which means Colossus will continue to look until you interrupt it, it finds a mate, or it has searched ahead.

Lastly there is the problem mode which has two sub-divisions. One sub-division will find normal mates in up to seven moves whereas sub-division two will find self-mates which is a major advance as many good chess computers do not provide this facility! There is no facility for help-mates (ie you help your opponent to mate you). This may sound strange but help-mates do occur in problems as do self-mates.

Special features

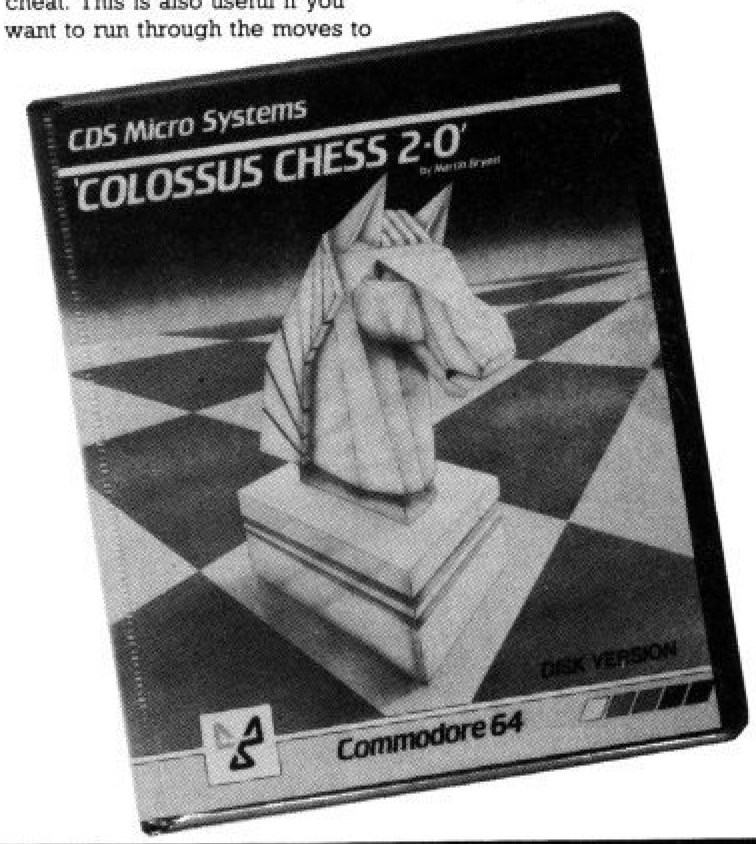
The 'Alter position' command will let you set up a particular position easily and if you make a mistake the original position can be recovered by pressing the 'G' key.

During the course of a game you can step backwards and forwards, so you can check mistakes and even replay the game. Colossus can also play against itself and you can replay the whole of any game at the speed you want. You can even set the elapsed times for each side and if you want to play a friend then Colossus will supervise to make sure you don't cheat. This is also useful if you want to run through the moves to get to a certain position. Finally, you can play 'blindfold' chess by making the board go invisible.

Naturally, you can save the game to tape or disk, not just from the stage you have reached but all the moves from the start to the current move (max 120). But there is a problem here: only one game per disk can be stored as Colossus always allocates the same name for the file. If this could be ammended so the user allocates the file name this facility would be perfect. The minor snag is that when you save the position you do not save the line of best play, which would be useful especially when you have had the machine running for hours. It would also be nice if one could get a hardcopy of the moves of the game.

Conclusion

Colossus is a well designed program including many features plus comprehensive opening theory not seen on other home micros and it must be the best chess program available for the Commodore 64 and at £9.95 on tape and £12.95 on disk, every keen chess player should have a copy. It is simple to use yet more fun than a board as you can learn so much more and, of course, you can play games whenever you want.



Draughts

This hardy perennial game has been written for the Commodore 64 and is available on tape from Superior Software for £7.95.

On loading the program, a 'which rules' caption is displayed. After selecting your rules such as 'must take all', the screen displays various options. When you have finished with the options the board is displayed, annotated like a chess board. Elapsed time for each side and how the computer is thinking is displayed as well, on the right of the screen.

Playing the game

Like chess, you can set the level of play and the games can be saved, loaded and replayed. The colours of the various parts of the screen can be altered and the moves can be input either with the cursor or through algebraic notation. Sound is used at appropriate times, for example, when the computer moves pieces or when you make an illegal move.

Conclusion

Draughts is a well-written program that provides more facilities than the original board game. But, like all computerised versions, you don't get that feel of satisfaction when you've jumped over a whole row of your opponent's pieces.

Kensington

Kensington is available for the Commodore 64 both on disk and tape from Leisure Genius at £12.95. Whichever you buy, the game comes attractively presented in a box with a 16 page manual. Thé object of the game is simply to try and occupy all six points of a white hexagon with your own colour stones.

On loading, Kensington displays a pattern of adjoining triangles, squares and hexagons. Colour is used but you cannot change them because they form part of the program like Scrabble.

In play

Only two players can participate whether both human, both computer or one of each. You are requested to place your stone on the board, which you do using the cursor controls illustrated in the manual. The first player to form a hexagon wins. During play if you form a triangle you can move one of your opponent's stones and if you form a square you can move two of your opponent's stones.

Conclusion

It is quite an entertaining enjoyable game at the beginning but now I can beat the computer on top level and I have not played more than half-a-dozen times! However against an opponent the game can last from 5 minutes to anything up to 5 hours.

- **Also available from Leisure Genius are two more old classics: Mastermind and Cluedo**

PUBLIC DOMAIN SOFTWARE

Othello

Othello, like Chess, is a game involving strategy, simple enough to take a minute to learn yet years to master. You have to capture your opponent's pieces by trapping them between yours. Othello comes on disk and most probably also on tape. And you can get it from the library of user-groups – providing you are a member. Two versions are available, human versus computer and human versus human!

Load and run

The board is like a chess board but with the numbers 1 to 8 arranged horizontally instead of vertically and the letters A to H vertical instead of horizontal. Moves are made silently, in fact sound is not used at all – even if you make an illegal move! Screen colours cannot be changed either.

The computer selects who shall move first. When it's your turn to play you show the computer where you want to place your piece by entering the cell reference, for example, d3, e6. If when it is your turn to move and you are unable to capture at least one of your opponent's pieces then you press 0. If you try and make an illegal move the computer lets you know.

When there are no more cells to fill or neither player can make a capture, the game ends and the computer states the winner and the score for each player. No running score is shown.

Monopoly

Monopoly has been adapted for the Pet and Commodore 64 under the name *Monopole*. Like Othello it is public domain software but the English version is only available to members of the user group ICPUG. Monopole is available on both tape and disk. A manual is not needed as the game is self-explanatory for those unfamiliar with the original board game.

Do not pass go ...

On loading Monopole and after a brief introduction the board is displayed. It is identical to the original board in colour and design, the sole difference is that the property names are not visible. You might think that's a problem. Not really, because when you land on a property the property name is immediately displayed on the screen and deed details and other information are available on separate screens.

To roll the die, you simply press R. If you want any information or you wish to carry out a transaction, such as mortgage properties you press T and various options will be displayed. You then select the option you require and the screen will then display the required information. You can then select another option or return to the game.

If the property belongs to another player Monopole automatically transfers the rent due and alters the balances so there is no squabbling.

Property development

Sound effects like the sirens when you go to jail are a big advantage over the board game. However, only two players can play which means that it is no longer a family game. Also when building on properties you have to distribute the houses as evenly as possible rather than deciding to have four houses on one property and one on each of the other two, for example.

Conclusion

The original adaption of this game was done for the Pet but the version for the 64 has the advantage of colour and sound. It is still an exciting game which will keep you amused for hours and as it is available free of charge what more can be said for it? The programmers have done a very good job.

Mastermind

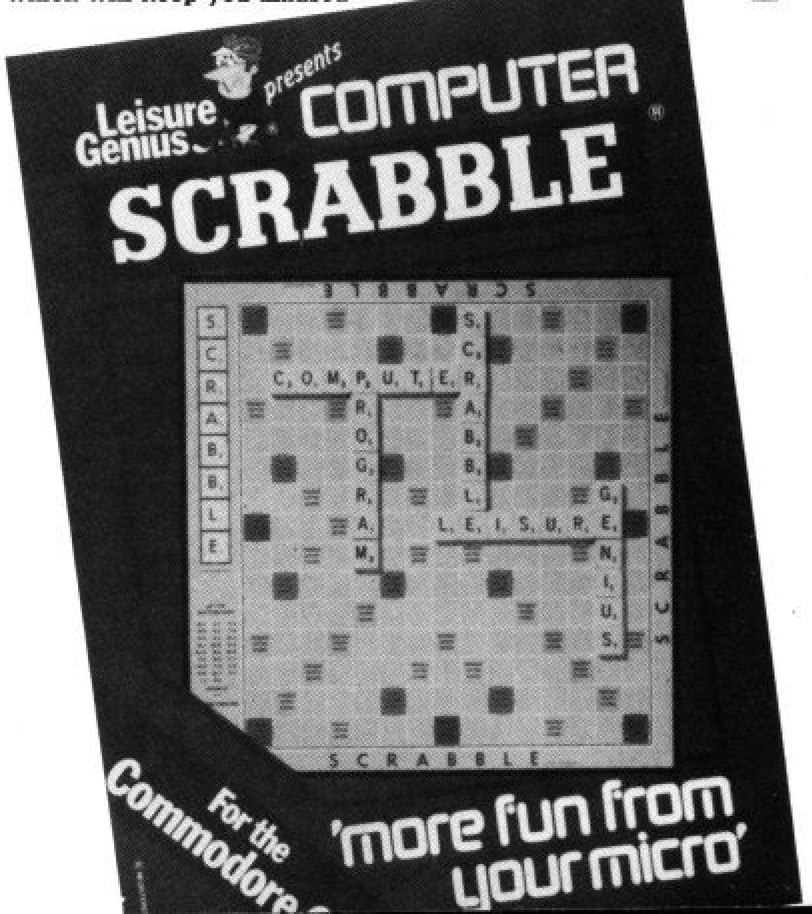
There are two versions of this game; one using colours and one using numbers. I will deal with the version using colours first. This has been written for the 64 under the name *Master Guess* and like Monopoly, is public domain software. As the instructions are simple and are displayed on the screen there is no need for a manual.

The object of the game is to work out the secret code which the computer has generated. A white peg indicates that you have guessed the right colour but the wrong location and a black peg indicates that you have both the right colour and the correct location.

The colours are represented by letters, for example R for red, Y for yellow, which seems a pity as colour graphics could have been used. You have a maximum of ten attempts at guessing the code and of course you cannot cheat by peeping like you can with the original board game. When you have made ten attempts or have beaten the code the master code appears.

Conclusion

This is a good imitation of the original but it is a pity that the colour, graphic and sound facilities of the Commodore 64 have not been exploited to the full. But for free, who can complain? The version using numbers has been written by Commodore Educational Software and is similar to the 'colour' version but this version has even less colour than the former and again, there is no sound. ●



Daily Mirror / Commodore User

Software Top 30

This Week	Last Week	Weeks in Chart	Title	Publisher	Computer	Spectrum	VIC 20	Commodore 64	Electron	Atari	Dragon	Oric	BBC	Other
1	–	1	**Ghostbusters**	Activision	CBM64			★						
2	1	2	**Daley Thompson's Decathlon**	Ocean	CBM64	★		★						
3	4	2	**Beach-head**	Access/US Gold	CBM64	★		★						
4	3	2	**Chiller**	Mastertronic	CBM64			★						
5	–	1	**Select One**	Computer Records	CBM64	★		★						
6	–	1	**Suicide Express**	Gremlin Graphics	CBM64			★						
7	6	2	**Wanted Monty Mole**	Gremlin Graphics	CBM64	★		★						
8	8	2	**International Soccer**	Commodore	CBM64			★						
9	5	2	**Zaxxon**	US Gold/Access	CBM64			★						
10	–	1	**Bruce Lee**	US Gold/Access	CBM64			★						
11	–	1	**Solo Flight**	US Gold/Access	CBM64	★		★		★				
12	10	2	**Summer Games**	Quicksilva	CBM64			★						
13	–	1	**Eureka**	Domark	CBM64	★		★						
14	–	1	**BMX Racers**	Mastertronic	CBM64	★		★						
15	–	1	**Blue Max**	US Gold/Access	CBM64			★						
16	2	2	**Jet Set Willy**	Software Projects	CBM64	★		★						
17	–	1	**Bionic Granny**	Mastertronic	CBM64			★						
18	–	1	**Lazy Jane**	Vortex	CBM64	★		★						
19	–	1	**Tornado Low Level**	Termian	CBM64			★						
20	–	1	**Danger Mouse in Double Trouble**	Creative Sparks	CBM64	★		★						
21	–	1	**Hunchback**	Ocean	CBM64	★		★	★					
22	26	2	**Manic Miner**	Bug Byte/Soft Proj.	CBM64	★		★						
23	–	1	**Cascade**	Cascade	CBM64	★		★						
24	–	1	**Zaxxon**	Mastertronic	CBM64			★						
25	–	1	**Zeta 7**	Mogul	CBM64			★						
26	–	1	**Scrabble**	Leisure Games	CBM64			★						
27	27	2	**Vegas Jackpot**	Mastertronic	CBM64	★		★						
28	13	2	**Football Manager**	Addictive Games	CBM64	★		★						
29	–	1	**Loco**	Alligata	CBM64			★						
30	19	2	**Flight Path 737**	Anirog	CBM64			★						

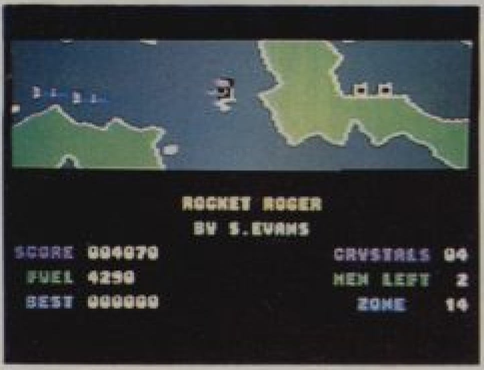
(Available on): Spectrum, VIC 20, Commodore 64, Electron, Atari, Dragon, Oric, BBC, Other

Top 20 Games for the 64

	Title	Publisher	Computer
1	**Ghostbusters**	Activision	C64
2	**Daley Thompson's Decathlon**	Ocean	C64
3	**Beach-Head**	Access/US Gold	C64
4	**Chiller**	Mastertronic	C64
5	**Select One**	Computer Records	C64
6	**Suicide Express**	Gremlin Graphics	C64
7	**Wanted Monty Mole**	Gremlin Graphics	C64
8	**International Soccer**	Commodore	C64
9	**Zaxxon**	Access/US Gold	C64
10	**Bruce Lee**	Access/US Gold	C64
11	**Solo Flight**	Access/US Gold	C64
12	**Summer Games**	Quicksilva	C64
13	**Eureka**	Domark	C64
14	**BMX Racers**	Mastertronic	C64
15	**Blue Max**	Access/US Gold	C64
16	**Jet Set Willy**	Software Projects	C64
17	**Bionic Granny**	Mastertronic	C64
18	**Tornado Low Level**	Vortex	C64
19	**Lazy Jane**	Termian	C64
20	**Danger Mouse in D'ble Tr'ble**	Creative Sparks	C64

Look out for the brand new 'Top 10' in the Saturday edition of the DAILY MIRROR EVERY FORTNIGHT.
The information for the Top 30 is compiled by N.O.P. Market Research Ltd, and founded by COMPUTER & VIDEO GAMES magazine in sponsorship with the DAILY MIRROR.

SCREEN SCENE



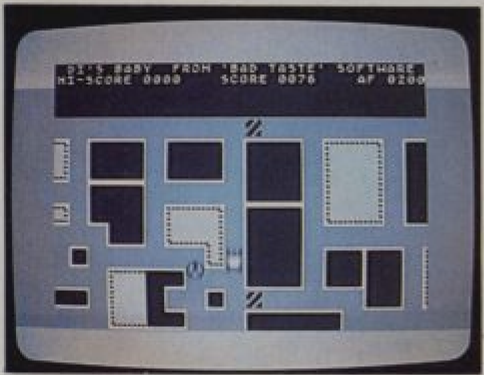
Rocket Roger
Commodore 64
Alligata
Price £7.95

Presentation: ■■■■□
Skill level: ■■■□□
Interest: ■■■□□
Value for money: ■■■■□

There's some real hover-bover here: a joystick can't be used simply because there are too many operations to perform concurrently. Try to combine the accuracy of upward thrust with lateral movement whilst pumping out laser bursts. Thirty four-way scrolling screens to immerse yourself in, though you must be prepared to accept a squashed playing area.

Perfecting keyboard control will keep you quiet for some time, then there are the mysteries of the planet itself. Really a practice mode, just to come to grips with jet-pack flight (and free fall!) is called for. Meteors are no respectors of your sensibilities and quickly eat up lives. To collect the 99 crystals demanded will require all your skill, guile and experience.

Above ground all the nasties are zappable; down in the hurdle-hoppers finishing school, patrolling androids are invulnerable, what's more in some zones a multitude of mortal meanies insist in warping in to plague you almost



Di's Baby
Commodore 64
Bad Taste
Price £6.95

Presentation: ■■■□□
Skill level: ■■■□□
Interest: ?
Value for money: ■■■□□

This one comes straight from the heart of the gutter (press). It's a five part piece of arcade garbage that sails so close to the wind that it's author may well find himself on a one-way tour to the Tower.

The destiny of the nation is in your hands. You must help the Royal Couple do what comes naturally whilst listening to suitably regal procreation music (no, it's not 'Careless Whisper'.)

Screen one is a topsy-turvy version of *Space Invaders*, with the meanies replaced by potties, and the mother ship by a nappy. The potty bombs bring a whole new dimsension to the idea of SPLAT! Though it adds weight to the arguement that royals are just like you and me.

Successful retaliatory shots to the potty bombs (number two screen, you might say) with toilet rolls bring you to the next stage. This is where it starts getting a little naughty. You must lead Charles to the haven of his nuptial bed. If everything goes according to the laws of nature then it's your job to watch over



Eddie Kidd's Jump Challenge
Commodore 64
Digital Integration
Price n/a

Presentation: ■■■■■
Skill level: ■■■□□
Interest: ■■■□□
Value for money: ■■■■□

The list of celebrities now endorsing computer games seems never ending.

At the last count we had Rolf Harris, Tony Hart, Lee Majors, the Stranglers, Thompson Twins, Shakin Stevens, the entire crew from Dallas and Roland Rat.

So it comes as no surprise that stunt bike rider – Eddie Kidd should want to jump on the bandwagon.

Eddie was at the Personal Computer World show in September in all his gear, signing autographs, and assuring all and sundry that he was really "into" computer games.

The fact that Eddie was brought in for his name alone matters not a jot as the game is an excellent one with some really impressive graphics.

The idea of the game is to successfully jump as far as possible and maintain control of the bike on landing.

Before you can attempt the classic Eddie Kidd leap over several cars you must first clear a row of oil barrels.

The bike and the rider are controlled separately so that the computer is acting as the motor bike and you are actually riding it.

The function keys provide the gear controls – F1, first, F3 second, F5 third,



Bruce Lee
Commodore 64
US Gold
Price £6.95

Presentation: ■■■■■
Skill level: ■■■□□
Interest: ■■■□□
Value for money: ■■■■□

Yet another celebrity lending his name to computer games – in this case the late Bruce Lee – the most famous exponent of the Martial Arts of all time.

Bruce finds himself in ancient Japan – his mission, a small matter of discovering the secret of eternal life.

The man who holds this secret lives high up on the summit of Mount Fuji in a fortified palace.

Determined to stop Lee from seeking an audience with the wizard are the Ninja and the particularly nasty giant green Yamo.

Bruce will need all of his agility, kicks and punches to defeat these foes. The toughest of his opponents are the Ninja who can dodge and kick back. The giant green Yamo can be taken out with three swift kicks.

Both the Yamo and the Ninja track you throughout the twenty screens of the game.

To move from one level to the next you must first collect all the hanging lanterns in that level.



Drelbs
Commodore 64
US Gold
Price n/a

Presentation: ■■■□□
Skill level: ■■■□□
Interest: ■■■□□
Value for money: ■■■□□

Drelbs is that rare thing these days – a different computer game.

Play commences in a maze at the centre of the Drelbs Kingdom. The maze is made up of swing-gates that change their position as you move through them.

The object of the game is to make as many complete squares as possible by closing the gates on the three-sided squares. Once a square has been 'closed' it will begin to pulsate. You have to secure all the potential squares on the grid.

Out to stop you are the Trollaboars who can also flip gates. The Trollaboars are the evil destroyers who are out to wreck your square building programme. Your only defence against the evil T's is to trap them temporarily in completed squares.

Once all your squares are complete some of them will turn into Drelbish windows – you can hop through these into the dark corridor.

You are now in the land of the Gorgo-

willy-nilly. Security lasers, slides and conveyor belts will provide headaches, especially as the Zone Master is ready to snatch a life for slow progress.

In a nut shell, *Rocket Roger* is an imaginative, obstacle strewn quest for treasure with a complement of intergalactic intruders likely to provide hours of engrossing entertainment. But only after you have perfected the delicacy of touch to exploit the rocket-pack fully. I'd be content to explore the whole play area, let alone "win".

Rocket Roger is further proof that there is plenty of programming talent left at Sheffield-based Alligata, despite the departure of one Tony Crowther Superstar.

Even if Tony's leaving has not had too serious an effect on the fortunes of Alligata it has made them slightly paranoid about talking to computer mags. One Alligata programmer apparently got the idea of branching out on his own as a result of the magazine interview.

Di for the next nine months.

She must fulfill her engagements, by avoiding or shooting persistent press hounds (the game might yet go down well at Buck House). Finally it's time for that mad dash to the hospital via a scrolling maze with all obstacles. Finally our heroine is forced to negotiate a ladder complex evading a syringe and catching the baby as it's dropped by a flight of passing storks. (that'll teach them not to use the NHS.)

Yes, it's really this mucky ... WE ARE NOT AMUSED, and neither it seems are those concerned – all we could get from Buck House was a terse 'no comment'. This game is for bad taste enthusiasts everywhere. Loyalists will hate it, Willie Hamilton supporters will love it.

The royals have so far evaded the attention of software houses – about the only part of the publishing world that has so far not tried to capitalise on royalty. It can surely only be a matter of time though, before we will be made to cringe at Royal adventure games.

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and F7 fourth. The Commodore key causes the bike to swerve to one side at low speed or can be used to abort a jump at the last moment if you judge that your speed is not sufficient to clear the obstacles.

The key to success in the jump game is to judge the speed accurately to get safely over the obstacle.

Eddie can be made to stand, lean forward, crouch down, or lean back in order to balance his bike.

The most exciting part of the game is when you take off and sail through the air watching those cars cruise past beneath you. If you should clip the last one Eddie falls and the bike spins hopelessly out of control as breaks squeal and you can hear metal hitting metal.

Apart from the jumps it is also possible to attempt other stunts – such as wheelies. To do a wheelie you simply build up speed and pull back on the joystick to make Eddie pull the handle bars up.

Although the graphics are tremendous I'm not sure there is enough of a lasting challenge to this game. That slight worry aside it is still bound to be a great hit with Eddie Kidd fans.

As well as punching and kicking the enemy Bruce can also be made to leap, jump and duck.

One great strength of this game is the options – there are lots of them. You can play against the computer, or an opponent, or two of you can team up to take on the computer.

Points are awarded for various achievements. Kicking the Ninja earns 75 points, a kick is worth 100, taking a lantern earns 125, knocking out a Ninja is worth 200, and knocking out a Yamo earns 400. Every time you enter a new room you get two thousand points bonus.

The largest bonus of all is awarded for killing the wizard – a massive 300 points. An extra Bruce is awarded when you reach 40,000 points and for every subsequent thirty thousand points after that.

Bruce Lee was the first of US Gold's really big hits when it was launched on the Atari earlier this year. Now 64 owners can get in on the action.

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lytes who have enslaved the Drelbs. It is down to you to free them – by making contact with as many Drelbs as possible. The Gorgolytes attempt to push you back onto the Drelbish maze.

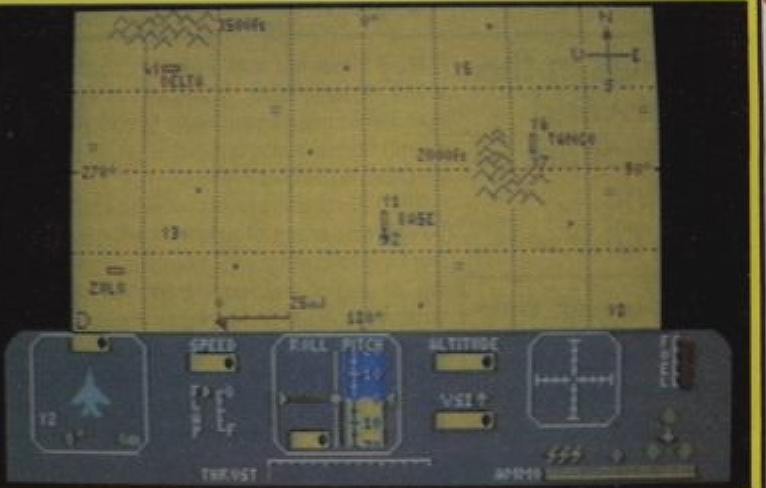
If you succeed in the dark corridor you can then get onto the bonus screen. The points you earn here will go towards freeing all the Drelbs still held captive.

There is one other way to get onto the bonus screen – by kissing the Mystery Lady. Her beautiful, but sad face will appear in one of the Gorgolyte squares for an instant. If you are successful in stealing your kiss you will jump to the bonus screen. Only when all the Drelbs have been freed will you discover the secret of the Mystery Lady.

Once you have been to the bonus screen the round starts again. There are eight different rounds altogether: Sapphire, Ruby, Emerald, Topaz, Peridot, Agate, and Amethyst.

Fun to play and commendably different.

• SCREEN STAR •



Fighter Pilot
Commodore 64
Digital Integration
Price £9.95 cass £14.95 disk



Presentation:	■■■■□
Skill level:	■■■■□
Interest:	■■■■■
Value for money:	■■■■□

In the battle for supremacy in the games market the British hits have been few and far between.

American importers with games like *Beach-Head*, *Bruce Lee* and *Boulderdash* have been cleaning up in recent weeks.

So it's nice to see one British company beating the various Yanksoft offerings in the dog-fight to produce the best flight game.

The company is Digital Integration and the game is *Fighter Pilot* – now available for the 64 after its Spectrum version topped the games charts for weeks earlier this year.

The game features all the superior sound and graphics that we have come to expect from Spectrum to 64 conversions.

Flight controls and game play options are many and varied. You can practice landing – one of the trickiest manoeuvres that any pilot has to cope with. Also you can attempt blind landing which simulates landing in the fog. If this does not sound difficult enough for you, you can also add extra hazards like crosswinds and turbulence.

To activate your guns, press the space bar – although you can only use these in combat mode. As with all the other modes in the game Combat mode has a training mode as well.

Training mode puts the enemy at a disgustingly unfair disadvantage – you can fire at them but they cannot fire back. If you just like blasting things then you can have great fun with the training mode – watching the enemy drift into your sights and then pick them off like flying elephants.

None of the other flight games I tested came close to *Fighter Pilot* for complexity and game-play. *Spitfire Ace* from US Gold – sounds like it should be a British game – has none of the sophisticated controls of the Digital game and none of the play options that make FP easy to get into but difficult to master.

There are no less than sixteen different commands that it is possible to execute – giving some of the real complexity of flying a jet fighter.

Fighter Pilot's programmer, Dave Marshall, is uniquely qualified to write a flight game – having worked for several years on computer systems for the Royal Air Force.

The flying training option positions your aircraft at the threshold of the runway base facing due North. Take off is slightly easier in this mode than in some of the later stages.

The main enjoyment of *Fighter Pilot* comes when you have mastered the controls and become a competent pilot. You can now take the USAF F15 Eagle into combat – which is *Fighter Pilot's* great strength over traditional flight simulations.

In this option you are scrambled and given a mission to defend four airfields.

Your air computer and radar tell you the position of the enemy aircraft and you set an intercept course. The dog-fight is on at less than a mile distance and 5000 feet altitude. Combat only takes place at this altitude. To turn and run – which will sometimes be necessary when you have sustained too much damage – simply dive below the 5000 feet level or distance yourself at more than a mile from the enemy.

If you sustain four direct hits you are finished. All hits are registered by a change in colour on your radar. If you do find it necessaary to turn and run to get repairs the enemy will lock on to his original target and set out to destroy your ground installations.

For my money *Fighter Pilot* is the best flight game now available for the 64.

SCREEN SCENE

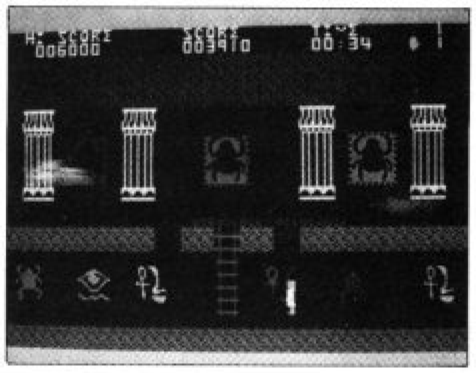
Orpheus in the Underworld
Commodore 64
Sterling
Price £6.95

Presentation: ■■■■■
Skill level: ■■■■□
Interest: ■■■□□
Value for money: ■■■■■

This is *Pitfall* but with Egyptian decor and a Hellenic Hero. "Can-Can" is the dominant tune, as you would of course expect from the title, but two other jingles provide some variation.

The 120 screens are littered with various combinations of hazards garnered from the following: pits, boulders (rolling or stationary), floor traps, white birds, poisonous green plants, moving saws and the essential magic vanishing holes. Below ground there is a continuous barrage of fireballs. Each subterranean screen is the equivalent of two on the surface.

Skills required are accurate well-timed leaping with hopping and ducking, equally essential adeptness at rope-swinging doesn't go amiss either. By taking advantage of the CHEAT keys it is possible to scroll your way through all the screens without losing a life, admiring the hieroglyphics and motifs as you grab the point-giving goodies. A good, colourful version of a well defined game.



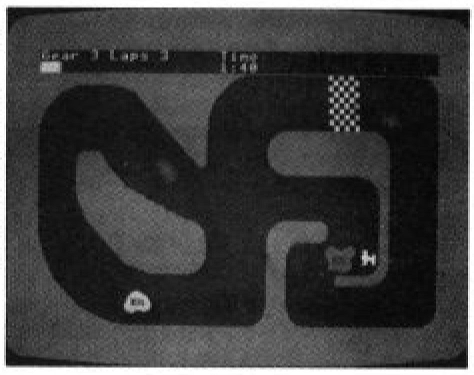
Stock Car
Commodore 64
Micro Power
Price £6.95

Presentation: ■■■■□
Skill level: ■■■■□
Interest: ■■■■□
Value for money: ■■■■■

An uprated, sophisticated example of that perennial filler for "Volcanic, Type-it-Yourself, Bugridden Games for your 64" books. Crash, bash, steer, skid and accelerate your way round 6 different tracks having selected the skid factor, overall speed and number of laps before the off. Oil patches can be splashed about for less traction, but added fun.

There are four cars on the track with the 64 controlling 2 or 3 (depending on how many mere humans are playing); all you have to do is steer and change gear.

Having blustered your way to victory, with "Congratulations" still ringing in your ears, it's time to enter the Hall of Fame spelling your name with the aid of another car. Rollicking fun for those of you out there who get bored with the Scalextric getting bent and buckled all the time.



Chartbuster
Commodore 64
Alligata
Price £9.95

Presentation: ■■■■■
Skill level: ■■■■□
Interest: ■■■■■
Value for money: ■■■■■

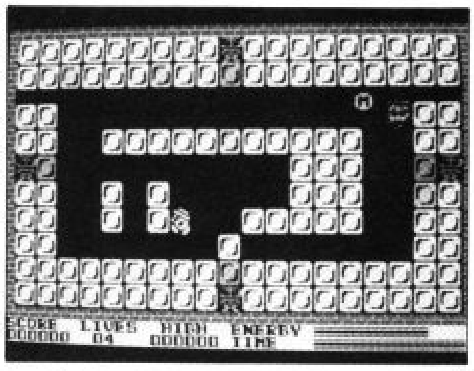
Devastatingly good value; comprising five games on one tape (and they all loaded!) *Blagger* is a 30 screen *Platform* indulgence. Collect all the keys and open the safes on each and every frame.

Killer Watt has you flying a saucer around a cavern popping light bulbs, avoiding walls and zapping dolphins which leap up from scattered pools. Purple ducks and bouncing bombs populate the trickier levels. A really good game.

Panic Planet is a straightforward version of the arcade classic. Dig holes and bash the red monsters when they fall in. Take too long about it and they leap out and change colour.

Eagle Empire sends flocks of phoenixes and waves of eagles to do battle with your space ship before you get to kapow the emperor in his egg-fortress: harmless fun for zappers.

Bug Blaster is a pseudonym for *Centipeed* and is as good as any I've seen with hordes of invertebrates to torment you.

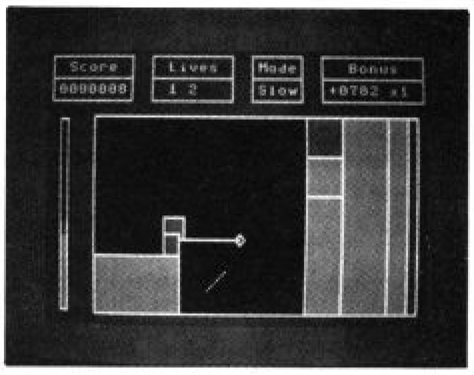


Frenzy
Commodore 64
Micro Power
Price £6.95

Presentation: ■■■■■
Skill level: ■■■■■
Interest: ■■■■■
Value for money: ■■■■■

Qix or *Stix* has surfaced again, this time with the enlisted support of "A Whiter Shade of Pale". Completely out on its own scenario wise: the player guides a module to partition the screen, trapping a manic stick within the last 5% of free screen or better still, drowning the rabid rod with a flood of colour.

There are two modes of progress; slow (green) and fast (red), the former worth more points. Each time contact is made with the screen edge or previously constructed line, Bingo! the colouring routine shades in the captured area. Of course, should the whizzing wand clobber you during mid-line you lose a life so it pays not to be too greedy (but, of course it's no fun if you're not.) On later screens "perimeter chasers" hunt you and the sticks multiply. The lure of this game is inexplicable, it's ridiculously simple and yet totally absorbing. You really should have this in your collection!



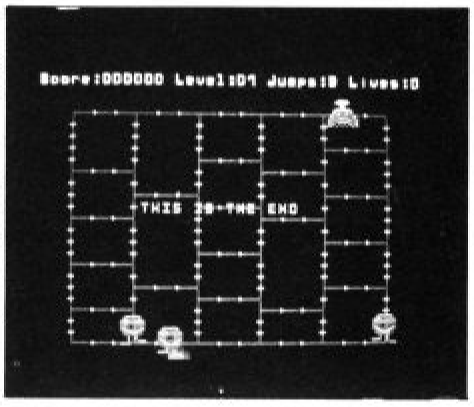
Hooper
Commodore 64
Calisto
Price £7.95

Presentation: ■■■□□
Skill level: ■■■□□
Interest: ■■■□□
Value for money: ■■■□□

Yet another game chopped up, rehashed and served up as something new. A split second after the first byte has been transferred from the accumulator, I sussed that this game was a direct descendant of *Crazy Painter*: that's the game where you dash round a grid colouring in the squares whilst perfecting your skill at avoiding the particular meanies selected from the day's menu.

A supple wrist is essential, or failing that, Paul Daniel's fingers (all 20 of them!) if you must use the keyboard. The music was just recognisable as *Rondo â la Turke*: rest easy Wolfgang Amadeus.

This variant has you collecting jelly beans as a mission in life. Competent, with deep reserves of tribulations to try your skill through six screens and eight speeds, but not the best available. So what's the point of doing it? More originality, less repeddling of old ideas please, software houses.



Choc-a-Bloc Charlie
Commodore 64
Lothlorien
Price £6.95

Presentation: ■■■■□
Skill level: ■■■■■
Interest: ■■■□□
Value for money: ■■■■□

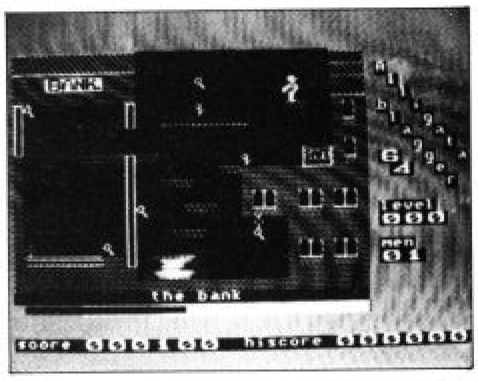
Reputedly there are 16 levels of play in this two-screen super-toughie. The set-up is like *Pengy* but the plot is individual. Our chum is trapped in a wharehouse. To escape he needs to create his own doorway by collating four purple blocks, which are embedded in a maze of useless white squares.

Isolated blocks may be pushed aside whereas others can be given the blast treatment. This course of action is energy draining, as is contact with those droids carelessly released on moving the purple pieces of Lego.

Obviously they need penning-in or avoiding, as do the time bombs left by the ultra-helpful resident meanie.

Gold blocks may be pushed through your exit for bonus points prior to your departure to the land or whirly wheels.

This tricky blighter is a real head-scratcher: my progress was painfully slow, excuse me while I practice. For experts only.



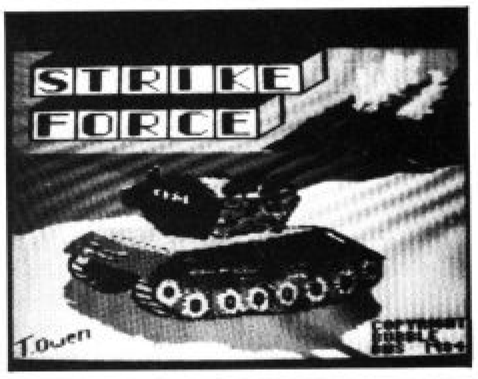
Strike Force
Commodore 64
Bubble Bus
Price £6.99

Presentation: ■■■■□
Skill level: ■■■□□
Interest: ■■■□□
Value for money: ■■■■□

The title page depicts a tank and for some unknown reason plays the theme from *Mash*. From then on you are inside the tank looking out along the gun barrels, scouring the horizon by scrolling the screen at will. Although the *Ballistic trajectory* of your fire is not as convincing as *Beach-Head* or *3D Tanx*, the same laws apply; effectively you control the height at which your shells explode, via markers, as well as the direction.

In the first wave scouting helicopters have to downed as they chatter across the mountainous landscape. These are merely paving the way for a bomber raid on your base; engage those foes on screen two. Assuming their bombs haven't nullified your defensive capacity, you get to take on enemy vehicles in the final stage, as they swarm through your HQ: scroll, search and destroy.

The difficulty levels (6 factors to set) may be finely tuned to taste. Graphics and sound are ok but not on the same peak as *Beach-Head*.



Warlok
Commodore 64
Callisto
Price £7.95

Presentation: ■■■■□
Skill level: ■■■■□
Interest: ■■■■□
Value for money: ■■■■□

OK, you're a *Scramble* fan but feel the old timer needs revamping, to present a fresh challenge. Well, *Warlok* has bitten off chunks from its familiar forebear, thoroughly chewed them up and regurgitated a highly interesting spin-off.

Up to four stages can be selected (I certainly don't pretend to have mastered them) with hazards presented differently enough from *Scramble* to warrant its devotees lurching out to grab a copy.

Mini mazes guarded by blipping laser screens, glittering bouncing cannon balls, space spiders(?) dangling from threads and indestructible droids are some of the delights that await you in the cavern. And, yes, energy has to be supped in the time-honoured fashion.

The graphics are not from the very edge of innovation but from what I've seen so far they deserve the thumbs-up. Silky scrolling and percussive sounds but no "Dance of the Sugar Plum Fairy", or similar, to sooth the troubled brow.



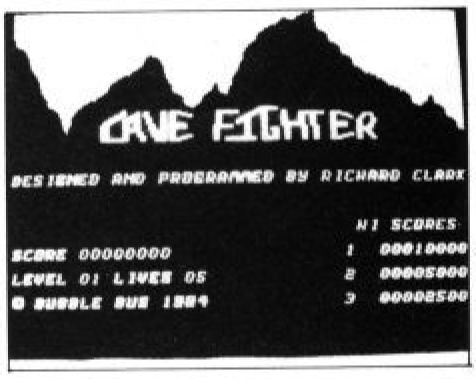
Cave Fighter
Commodore 64
Bubble Bus
Price £6.99

Presentation: ■■■■□
Skill level: ■■■■□
Interest: ■■■■□
Value for money: ■■■■□

By allowing yourself the luxury of 99 lives, it is possible that all the 31 pre-selectable, scrolling caves will reveal their secrets to you. I suppose this is a *ledge*, as opposed to a *platform*, hopping game.

There are ropes to climb, leaps to be made and 16 alien cavern-creepers to startle (well, amuse) you. A jumpometer, activated by the fire button, controls the height of your leap; an important consideration in regions with restricted head-room.

Danger areas to avoid are rock pools, jagged edges, snapping jaws, scouring the ropes and conglomerations of spitting aliens. Some of the tight squeezes appear to allow one pixel width for error. Precision is the watchword. As you would expect, the cave layouts get progressively tougher, while in each case the disposition of the nasties is entirely randomised. "Chariots of Fire" and various squeaks are processed by the SID chip in this chunk of addictive entertainment.



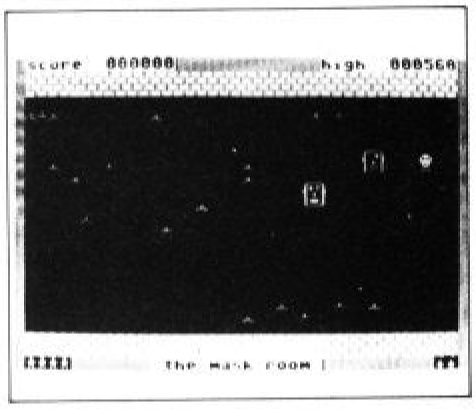
Tazz
Commodore 64
Bubble Bus
Price £6.99

Presentation: ■■■■□
Skill level: ■■■□□
Interest: ■■■□□
Value for money: ■■■■□

Bug blasting has proved to be a rich vein for programmers; this latest nugget to be mined is slightly different from the norm. Your alter ego is dumped in a succession of ten rooms, each well peppered with mini-bugs and mega-bugs, very mobile sprite-nasties whose behaviour, form and temperament vary with each cubicle.

Umpteen rounds of ammo plus a renewable arsenal of smart bombs are at your disposal, giving you the wherewithal to vaporise everything obnoxious before the advancing walls wreck havoc with your overall dimensions! After clearing each second room, up pops a bonus screen; digits and bombs to collect, but again beware of the marching masonry.

A good blast-'em-away, with an extra edge-of-your-seat, nightmare add-on. Should you find it all too easy there are another ten super rooms to tangle with. So keep your thumb on the button and your eyes on the screen if you don't want to end up as flat meat. Good fun but with no new ideas. Are screen zappers bothered?



SCREEN SCENE

Kokotoni Wilf
Commodore 64
Elite
Price £6.95

Presentation: ■■■□□
Skill level: ■■■■□
Interest: ■■■□□
Value for money: ■■■■□

Highly individualistic, offbeat – weird even ... according to your viewpoint. Working your way through time zones is a sure-fire interest grabber as is the challenge of mastering the idiosyncrasies of feather-powered flight. But performing just one task repeatedly could make this game a bore.

You have to flutter around a four-way scrolling obstacle course avoiding the touch of just about everything, animate or otherwise, whilst endeavouring to snatch a complete set of talismans, this being the key to the next epoch. There is something strange about fluttering around the statuesque dinosaurs (only the small species move) but this can be accepted as "video-game logic". Quite apart from the wild world on the surface there are twisting caverns aplenty; most of the tight squeezes seem virtually impassable to any but previous flyers.

If you are dedicated enough then there is plenty of scope to stretch your wings.



Jinn Genie
Commodore 64
Micromega
Price £8.95

Presentation: ■■■□□
Skill level: ■■■□□
Interest: ■■□□□
Value for money: ■■□□□

An *Arabian Nights*-style, four part pot-boiler. Before you can finally free an imprisoned sage from the custody of an evil genie there's some travelling to do. Devils home in on your flying door mat, though naturally you can vaporise them.

After landing at the Genie's palace an open window has to be found. This quest entails dodging about a maze, eluding the guards and trying all the windows. Once inside, all the torches have to be lit though guards insist on extinguishing them: also beware of the spider (there's always one!) who may send you reeling. With the aid of your stun whatsit the brightness finally shines forth revealing a magic jar. Into the Genie's den you drag the urn, whereupon you discover the prisoner and key: put the three together to free the Wizard. The graphics are fair enough and you do get a helping of Eastern music. After two games at level one I was left pondering why such a lot of effort had been expended producing the game.



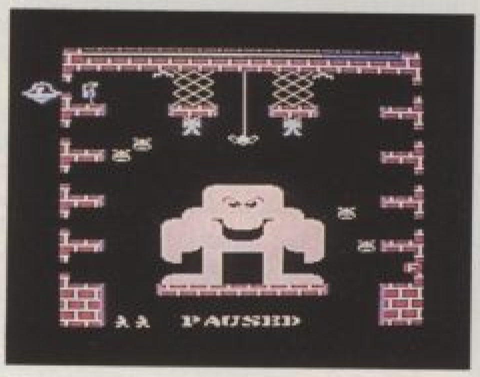
Jet Power Jack
Commodore 64
Micro Power
Price £6.95

Presentation: ■■■■□
Skill level: ■■■■□
Interest: ■■■□□
Value for money: ■■■■□

We could soon be knee deep in *Jet Pack* games, so choose with care. This example is entirely distinct from *Rocket Roger* (the other newie), even the "feel" of the knapsack thruster is different. If you haven't read the ad, fate has decreed that a gruesome galactic gargoyle should capture and hold you incommunicado in a space garage ... but of course, where else?

By welding the thruster controls to your inner will, Jack will pass with facility through a screenful of bone-shatteringly sharp-edged walls, electrified garage fittings, aliens generally zooming up and down like crazy with still more cussedly bobbing about at a slower rate of knots. No zapping allowed as you attempt to ferry a fuel pod to stoke up the fires in your escape craft. There is very little safe ground and a scant one minute's supply of oxygen.

Any room may be selected, so you can trip gingerly through all five gauntlets at will. Not my favourite game but hard to fault.



Ankh
Commodore 64
Beyond
Price £8.95

Presentation: ■■■■■
Skill level: ■■■■■
Interest: ■■■■□
Value for money: ■■■■□

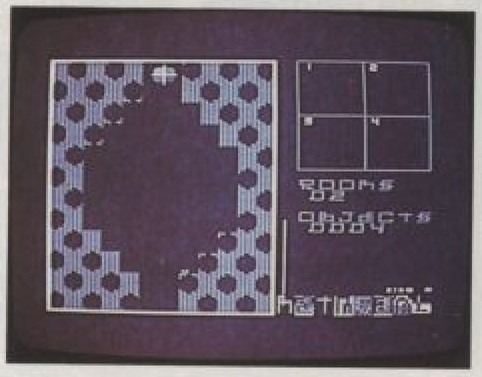
Subscribers to the theory of a parallel universe may well find food for thought here.

In theory, your conscious, elemental being has been encapsulated in a module which handily totes a gun and a retractable probe; you guide this sensor package through 64 rooms trying to unlock doors, defuse traps, accumulate treasure, pick up tools and generally ponder the nature of metaphysical reality. Experience, both visual and audial, will equip you to make progress as will the occasional sharp shooting.

Could this be thought of as an archetypal *Adventure Game* in a primeval, pure state? Perhaps. At any rate the interest will last as long as the esoteric conundrums haven't yielded to your dilligent, inspired examinations, which in most cases will equate with eons.

Be warned! ... this is a puzzle ... not a game.

● **Turn to page 73 for your chance to win a copy of this exciting game!**



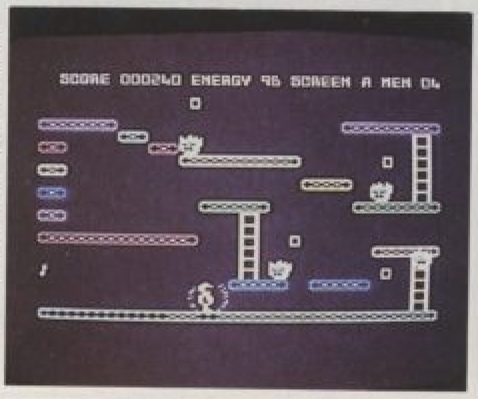
Mr Robot
Commodore 64
Beyond
Price £8.95

Presentation: ■■■■■
Skill level: ■■■■□
Interest: ■■■■■
Value for money: ■■■■■

First master machine code; then study games design, majoring in the *platform* idiom and you will be all set to produce "I was manic miner's double". No need to trouble as appended to Mr Robot is a factory where creating testing courses for level-hoppers is as easy as ... well ... pressing the fire button. At the foot of the screen are all the units needed to conjure up an arcadian's dream: edit and position the building blocks with the cursor. Your brain-child may be played ad nauseum but only disk users can save the extra screens for posterity.

The game itself features 22 screens – from "getting started" to "in theory it can be done" – classic, helter-skelter gathering from inaccessible ledges. Features? Greasy poles, escalators, trampolines (good bounce simulation here), energiser pills, bombs, ladders (naturally), treadmills et al. Patrolling the ledges are fiery aliens which need extinguishing; that just leaves the transporter modules to master.

Good, brazen use of colour plus the ability to select any screen makes this a bumper-fun package.



Deals for Readers

Make your disks go like lightning!

1541 EXPRESS

Ingenious plug-in cartridge accelerates disk transfers – see the October review for full details. By RAM Electronics, who really do these things well.

Normal price: £49.95
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VICSPRINT for Vic & 64
Trippler Interface

Serial IEEE to Centronics converter which doesn't use any program memory space. Plugs into the user port on Vic or 64 to interface with most printers (either daisywheel or dot matrix), and will work with most commercial packages. A RAM Electronics product
RRP £49.95

OUR PRICE £45.95

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To take advantage of these offers just fill in the order form on the back page.

STACK FOR THE VIC

Vickit 2: add nine programmer's aid commands and a dozen graphics commands to your Vic. RRP £6.00 chip, £13.00 cartridge ... our price:

EPROM £4.90
CARTRIDGE £11.25

Vickit 3: give a Vic twenty new commands for hi-res graphics. RRP £6.00 chip, £13.00 cartridge ... our price:

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Vickit 4: fast cassette load – loads and saves up to seven times faster. Includes auto-tape position and source text editor. RRP £6.00 chip, £13.00 cartridge ... our price:

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CARTRIDGE £11.25

RAM 'n' ROM cartridge: for Stack's Vickit chips ... our price:

£6.00

IEEE Cartridge: run Pet peripherals on the Vic. RRP £38.00 ... our price:

£26.40

Vic Four-slot Switchable Motherboard: plugs four cartridges into one cartridge slot. RRP £15.00 chip ... our price:

£13.80

Storeboard: plugs into the cartridge slot to add 8K extra memory and a freebie Vickit 2. RRP £30.00 ... our price:

£20.50
CARTRIDGE £11.25

TWO SPECIAL CARTRIDGES FOR THE 64

We've commissioned two special add-ons for the 64 from Whitby Computers, another company whose products we reviewed and liked. Just look at what you get:

The Commodore User Toolkit Cartridge

... for easier programs

What everyone needs:
AUTO automatic line numbering
DELETES deletes specified lines
FIND lists all lines containing specified string
LINES instantly calculates the number of lines in your program
MERGE merges program from disk or tape, interleaving lines if necessary
RENU renumber program (including GOTOs, THENs, GOSUBs, etc)

Handy for variables:
DUMP lists names and current values
VAR lists variable names

Sexy sprites:
DESIGN multi-colour sprite editor
SPRITE sets position, colour, mode
HITBACK detects sprite hitting background
HITSPR detects sprite hitting another sprite

Neat extras:
MON Pet-type machine code monitor
USER add new commands
FUNC defines function keys
SHRINK removes REMs and all unnecessary spaces
CURSOR puts the cursor at specified position
... and much more

PRICE: £27.50

David's Basic

... for better programs

Ways with numbers:
AVG averages elements in an array
MIN finds the smallest number in an array
MAX finds the largest

Ways with strings:
PAD$ fills out a string with spaces
SEARCH searches array for given string
SORT sorts arrays

Extra goodies:
CHINKLE rings a bell
ERROR intercepts program errors

Clever programming:
CIF conditional IF
CEND conditional END
ELIF Else If
ELSE Else
POP removes last subroutine from stack – avoids 'out of memory' errors
PUSH puts a subroutine return address on to stack – simulates GOTO
EXEC a bit like PROC or labelled subroutines
ON used as ON <key> GOTO or GOSUB
SWAP loads another program, retaining all variables

Defter displays:
CLOCK continuously displays the time at stated position
COL$ simplifies use of 15 colours
LWIND Load Window – loads a ready-to-go screen display from disk
DISP displays centered message

Easier input:
DATE$ turns a numeric date back into a conventional date string format
DATIN foolproof date input routine
GENIN foolproof input routine – checks input against specified pattern of acceptable characters
NUMIN foolproof numerical input

Perfect printing:
PRINT% automatically justifies columns of money figures
PRINT# adds true printer tabs
SCOPY screen copy
... and 18 other commands

PRICE: £27.50

SPECIAL BARGAIN OFFER:
order the two at the same time and save a fiver – £50 for the pair!

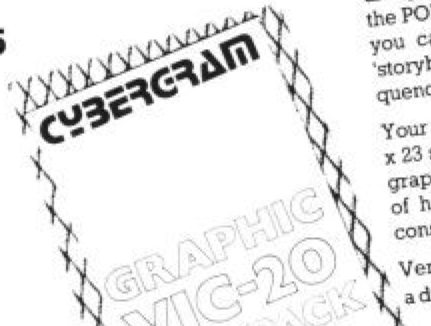
CYBERGRAM

DESIGN YOUR OWN VIC SCREENS

Brilliant idea, though it's simple really; the Cybergram Designs Vic-20 Graphics Aid Pack is a set of overlays and printed sheets on which you can immediately see the POKE locations you need for display and colour; and you can use successive sheets to set up a specific 'storyboard' from which to organise and visualise the sequences in a graphics program.

Your pack includes planner sheets for the standard 22 x 23 screen and plotter sheets for the 1023 x 1023 hi-res graphics using the Super Expander; you also get a set of handy character designer sheets that simplify the construction of your own shapes.

Very neat, very clever – and really useful too ... and at a discount from the normal RRP of £4.50.



Normal Price £4.50
OUR PRICE £4.20

KEEP IT CLEAN

Keep your cassette and computer clean with matching black covers – effective, efficient.

Sticky keytops? Things falling past the keys into the computer or the tape heads? Don't take the chance. When you're not using your Vic or 64, slip over one of our tailored **Commodore User** dustcovers – a smart black number featuring the magazine's logo on top. They do keep out dust, but they'll also cope with coffee splashes (anything less than a thunderstorm in fact!), paperclips, cigarette ash, the residue of longhaired cats, and the general detritus of daily life.

£2.50 computer covers
£2.00 cassette covers

£4.25 one of each



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Commodore User tee-shirts and sweatshirts are in good-quality cotton, ideal for late nights in front of the computer or the beach at Torremolinas or the lounge bar at the Pig and Whistle.

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Cobalt blue, with the magazine's logo big and bold across the chest. State size when ordering: we have small, medium, large and extra large.

Sweatshirts
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FALLING APART?

Our Commodore User binder holds 12 issues of the original-size magazine (and Vic Computing fits too!) Dark blue with the magazine's name in gold: smart, sturdy and sensible – the mags are held in by strong elastic grips, easier and neater than the other kind of binder that has metal rods for the purpose.



OSIRISAN SYMBOLIC Assembler/Disassembler

A major update and enhancement of the well reviewed (June 84) Freditor Osirisan assembler from Elmhirst Enterprise. A symbolic disassembler has been added which allows synthesis of your own program source which you can then view, alter and reassemble. Disk users will additionally now get the powerful verison 3 editor.

Tape: £17.95
Disk: £22.95

SIMPLY WRITE

Simple, low-cost word processing for Vic or 64

You won't find a better word processor at the price – has all the functions you'd ask for from a £200 package, and it's friendly and easy to use too.

Disk or tape at only £34.95

Instant database for your 64

INFOTAPE

Why buy lots of different data storage systems when just one will do? INFOTAPE 64 is a powerful yet easy to use database system for tape users, and stores up to 3,000 data items with you defining the number of fields per record. Totally flexible; and interpretive in nature, with the user having the command of what data is stored and how. And file characteristics may be changed after the file has been created. Powerful 19-function calculator is built-in (giving spreadsheet capability): batch processor can update or delete all or selected records. A full report generator is included to provide anything from a gummed label for a mail shot to tabular reports...

Normal price: £16.95
OUR PRICE: £9.95

Special Offer: When you upgrade your system to use a disk drive, INFODISK will be able to retrieve your tape records – and your INFOTAPE order from us comes with a £20 off voucher against the disk version!



STACK FOR THE 64

Zap-proof joystick £7.95

Stack claims this joystick is "almost" unbreakable: we'll vouch for that. Non-slip rubber sucker feet, two fire buttons, shaped grip.

Four-slot Switchable Motherboard for the 64

Instant expansion for the 64. Plugs into the cartridge slot, lets you plug in up to four cartridges.

Normal: £38
£29.95

Instant Interfaces

Plug any printer into your 64

Run any printer (or plotter, or maybe even modem) on your 64. These interfaces by Stack convert the 64's odd IEEE signals into something the printer can handle.

Centronics Interface:
Normal £24.00
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RS-232C Interface:
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The HELP Cartridge for the 64

All those extra commands you want!

A programmer's aid cartridge for the 64 from Stack. Adds twenty toolkit commands to Basic (auto line number and renumber, find, step, trace, etc: plus hex-dec converter) and a comprehensive monitor and disassembler and several single-key disk-handling commands.

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OUR PRICE £22.50

The Arrow Cartridge

Tape save/load seven times faster!

£26.00

This Stack cartridge for the 64 gives *not just* the high-speed cassette operation ,,, *but also* a full version of the TIM Machine Language monitor ... and fast-forward to any of nine predetermined positions on a cassette ... and a hex-dec converter with hex arithmetic built in.

CBM 64 Basic Compiler

This turns your normal Basic programs into superfast machine-language-speed code! On tape.

Normal Price £14.95
OUR PRICE £13.45

BOOK Corner

The most useful books we've found for the Vic & 64.

Dennis Jarrett: Getting the Most from Your Vic-20:
Just bought a Vic-20? Then you'll need this comprehensive, carefully designed book to help get to grips with it.

Commodore 64 Subroutine Cookbook: David Busch
For would-be programmers everywhere. It's concise and accurate with excellent line-by-line descriptions guaranteed to turn you into an expert.

The Complete Commodore 64: Dennis Jarrett
Another excellent book – covering all the angles of the 64 to help both beginners and experts alike.

The Good Computing Book For Beginners (3rd edition):
The essential A-Z on computing. Wittily scripted, well thought out but most of all thorough.

MusiCalc

MusiCalc is a Deals For Readers product – see the Musicalc ad in this month's issue

COMMODORE User

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01-241 2448

Save over £50.00 in this month's catalogue with a wider range of deals on the best of Vic and 64 products.

Some of them, like the dustcovers and the Victuals tapes, we have produced ourselves. The others are things that we regard as Good Ideas and Good Value, mostly items reviewed in Commodore User.

On most of those we have fixed up discounts for readers (and while we aren't allowed to sell books at cut price, we can include P&P in our price)

If you want to take up any of the offers, just use the Order Form on the back page.

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the pick or reader's programs for the Vic

VICTAPE ONE – ten games for any Vic

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SPECIAL – ORDER ALL THREE PACKS FOR £17.99

HAVE AN ADVENTURE THIS CHRISTMAS WITH LEVEL 9

"The appearance of a new program from Level 9 is a flag-day for all aspiring adventures and, in my household, a signal for the cat to hide under the bed for the duration against the inevitable moment when I go rampaging through the flat, a wild look in my eyes muttering ferociously about bricklaying birds nudist beaches and the like. Since *Return to Eden*, the sequel to *Snowball* is out, the cat may be in hiding until Christmas.

You don't need to have played *Snowball* to get into the sequel as ever, there is ample documentation with the tape which in my Commodore 64 version (it is also on the Spectrum, Amstrad and BBC), is turbo-loaded. It starts with you, agent Kim Kimberly, having been framed for sabotaging the colonyship Snowball, in a crashed stratoglider on the planet Eden. For the moment your mission is to survive the misplaced retribution by your own people, but life gets very much more complicated than that. Solving these puzzles has nothing to do with luck; you either figure your way out of trouble on Eden or die there. One major difference between this and former Level 9 efforts is that the Spectrum and C64 versions have graphics of a very high quality and can be switched off if required. The scope of the vocabulary appears unscathed by this addition.

Even experienced adventurers will probably get fried a few times by the avenging engines of the Snowball, before discovering how to take shelter. But, once that hurdle is passed, the real adventure begins, and it's a lulu.

From the radioactive desert caused by the engine blast, you progress through a variety of hazards through some highly unlikely locations.

I haven't got to that point yet, and so far superhuman willpower has stopped me using the clue sheet provided, but I can't hold out very much longer since I am having what could be lethal communication problems with some robots. Terrific fun, but should carry a mental health warning."

Popular Computing Weekly 7 Nov 84



DISTRIBUTORS

If your local dealer doesn't stock Level 9 adventures yet, use the coupon to buy them from us, or ask him to contact: Centresoft, Microdealer UK, Lightning, R&R, Leisuresoft, PCS(SW), MCD, TBD etc.

	Cassette £9.95	Disk £11.95 BBC or CBM64
COLOSSAL ADVENTURE: The classic mainframe game, with 70 bonus rooms.	☐	☐
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SNOWBALL: Immense Science Fiction game with over 7000 locations.	☐	☐
RETURN TO EDEN: Vegetarian adventure. (Amstrad, CBM 64 and Spectrum versions have 240 pictures).	☐	☐
LORDS OF TIME: Imaginative romp through World History.	☐	☐
ERIK THE VIKING: Family game for BBC, CBM 64 and Spectrum only. All with 180+ pictures.	☐	

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LEVEL 9 COMPUTING
Dept CU 229 Hughenden Road
High Wycombe, Bucks. HP13 5PG

AMSTRAD BBC CBM64 SPECTRUM MEMOTECH NASCOM ATARI

Victuals

MUSIC 64 — COMMODORE 64



Not just another music program, this one actually calculates the exact pitch of each note to produce an even-tempered scale over seven octaves.

Lines 50 and 60 take care of this. By altering the value of 'c', the 'instrument' can be tuned to match your guitar or piano!

The music is stored in Data statements read by lines 100-160. The information is stored in the Data statements from line 400 on, and each item is structured in the following way, to make it easy for you to create your own music.

Each Data statement can contain any number of items, as long as they don't exceed the 64's limit of 79 characters. Each item should contain nine characters excepting items for defining voice/tempo changes, for example, line 434, which takes the form (waveform 1...3(, new tempo /10):- three for each of the three voices. Where a voice is not required to play, the relevant three characters are filled with 'x's. This is largely to assist you in entering the correct number of characters per data item.

This is intended as an 'experimenters' program, so be prepared to experiment to get the results you want. Have fun . . .

by Peter Bartley

```
9 REM***********************************
10 PRINT"[CLS][CTRLN][CTRLH]":POKE53281,12:POKE53280,11:A$="[WHT][GR3][L GRN][L
BLU][CYN][L RED][YEL][GRN][BLU][PUR][RED][ORG][BRN][BLK]":FORI=13TOOSTEP-1
11 FORJ=1TO14-I:PRINTLEFT$(A$,J)"[6CR][G>B]ACH-64 STYLE![CU]":FORT=1TO30:NEXTT,J
:PRINT
12 NEXT:FORI=1TO2000:NEXT:PRINT"[2CD][YEL][G>T]RANSLATED TO THE '64 BY [G>P]ETER
 [G>M] [G>B]ARTLEY"
13 FORI=1TO2000:NEXT:PRINTTAB(17)"[RED]AND":FORI=1TO2000:NEXT
14 PRINT"[CD][G>D]EDICATED TO THE STAFF OF [PUR][G>C]OMMODORE [G>U]SER"
19 REM***********************************
20 DIMA(12,6),B(12,6):F=32:Q=16:R=16:X=10^6:Y=10^4:Z=100:H=170
30 S=54272:S1=S+1:S2=S+4:S3=S+7:S4=S+8:S5=S+11:S6=S+14:S7=S+15:S8=S+18
40 FORA=0TO24:POKES+A,0:NEXT
50 FORI=1TO12:FORJ=0TO6:C=57743/2^((13-I)/12+J)
60 A(I,J)=INT(C/256):B(I,J)=INT(C-256*A(I,J)):NEXTJ,I
70 POKES+5,42:POKES+6,48:POKES+12,106:POKES+13,48:POKES+19,74:POKES+20,51
80 POKES+24,15
90 POKES+2,0:POKES+9,0:POKES+16,0:POKES+3,1:POKES+10,1:POKES+17,1
99 REM***********************************
100 READA$:IFLEN(A$)=9THEN130
110 IFA$="1END"THENEND
120 W=VAL(A$):P=W/X:W=W-INT(P)*X:Q=W/Y:W=W-INT(Q)*Y:R=W/Z:H=(W-INT(R)*Z)*10:GOTO
100
130 D=VAL(LEFT$(A$,3)):E=VAL(MID$(A$,4,3)):F=VAL(RIGHT$(A$,3))
140 IFDTHENPOKES2,P:D1=D/10:D2=D-10*INT(D1)
150 IFETHENPOKES5,Q:E1=E/10:E2=E-10*INT(E1)
160 IFFTHENPOKES8,R:F1=F/10:F2=F-10*INT(F1)
199 REM***********************************
200 IFD>0THENPOKES,B(D1,D2):POKES1,A(D1,D2):POKES2,P+1
210 IFE>0THENPOKES3,B(E1,E2):POKES4,A(E1,E2):POKES5,Q+1
220 IFF>0THENPOKES6,B(F1,F2):POKES7,A(F1,F2):POKES8,R+1
300 FORT=1TOH:NEXT:GOTO100
399 REM***********************************
400 DATAXXX114XXX,XXXXXXXXX,113XXXXXX,012XXXXXX,032114113,062XXXXXX,042XXXXXX
402 DATA042084113,082XXXXXX,062XXXXXX
404 DATA062114034,112XXXXXX,102XXXXXX,112XXXXXX,062XXXXXX,032XXXXXX,113114034
406 DATA012XXXXXX,032XXXXXX
408 DATA042114014,062XXXXXX,082104-10,062114034,042XXXXXX,032XXXXXX,012084044
410 DATA032XXXXXX,113XXXXXX
412 DATA103013064,113XXXXXX,012XXXXXX,063104-10,103XXXXXX,012XXXXXX,042104064
414 DATA032XXXXXX,012XXXXXX
416 DATA032114-10,113XXXXXX,012XXXXXX,032114084,062XXXXXX,042XXXXXX,042114044
418 DATA082XXXXXX,062XXXXXX
420 DATA062114034,112XXXXXX,102XXXXXX,112XXXXXX,062XXXXXX,032XXXXXX,113114034
422 DATA012XXXXXX,032XXXXXX
424 DATA083114044,062XXXXXX,042XXXXXX,032AA4054,012XXXXXX,113XXXXXX,063064-10
426 DATA113XXXXXX,103043XXX
428 DATA113033114,032XXXXXX,062XXXXXX,112XXXXXX,062XXXXXX,032XXXXXX,113-10-10
430 DATA032XXXXXX,062XXXXXX
432 REM
434 DATA64323251
436 REM
438 DATA032113114,XXXXXX104,042113084,062012104,XXXXXX084,062103064
440 DATA042113084,XXX063104,032XXX114
442 REM
444 DATA32646417
446 REM
448 DATA012063104,063-10XXX,083XXXXXX,103XXX-10,012XXXXXX,113XXXXXX,012XXXXXX
450 DATA042XXXXXX,032XXXXXX
452 DATA042064XXX,012XXXXXX,103XXXXXX,063XXXXXX,103XXXXXX,012XXXXXX,042064XXX
454 DATA012104XXX
456 DATA032114114,113XXXXXX,012XXXXXX,032XXXXXX,062XXXXXX,042XXXXXX,042114084
458 DATA082XXXXXX,062XXXXXX
460 DATA113114034,112XXXXXX,102XXXXXX,112XXXXXX,062XXXXXX,032XXXXXX,113114084
462 DATA012XXXXXX,032XXXXXX,012043044
464 REM
466 DATA32646409
468 REM
470 DATA032XXXXXX,042XXXXXX
472 REM
474 DATA32646417
476 REM
478 DATA032063064,012XXXXXX,113XXXXXX,063043064,113XXXXXX,103XXXXXX,113033114
480 REM
482 DATA32646468
484 REM
486 DATAXXXXXXXXX,XXXXXXXXX,-10-10-10
488 DATA-10-10-10
490 DATA1END
```

UREKA — UNEXPANDED VIC 20

Package tours ain't what they used to be. According to Simon Veryard, you're on holiday on the Planet Thorn, a place famous for its rocket rides. Unfortunately, just like everything on holiday, they cost too much money.

But help may be at hand in the form of money bags falling from the sky. More explanation? Well, the crooks that robbed the local bank forgot to close the hatch of their getaway rocket — sounds reasonable.

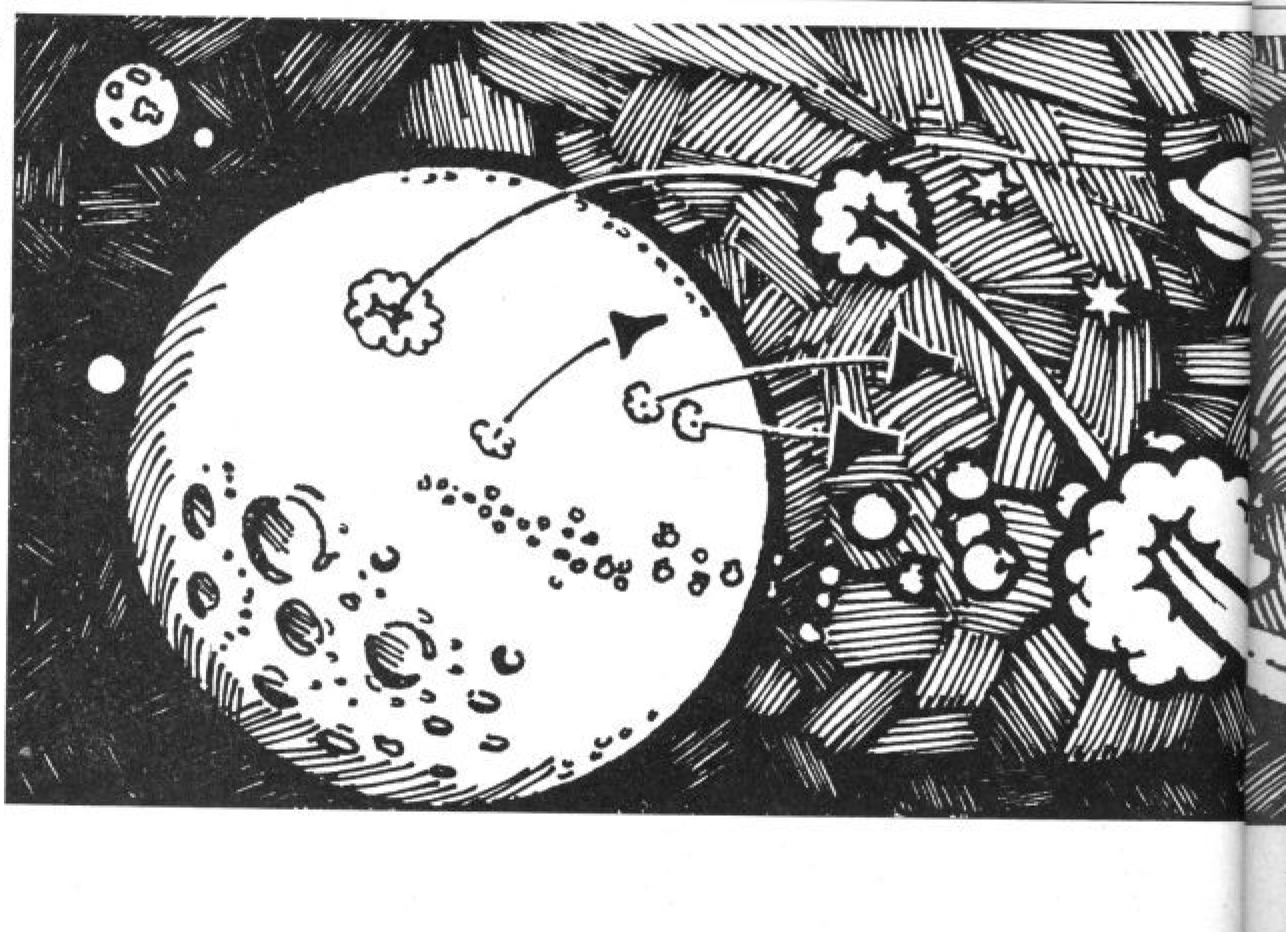
You need to collect ten bags to pay for a rocket trip. Oh, and don't forget to avoid the killer Thunder Bolts and the Cyclons — citizens of the planet who don't like the idea of you frittering away their hard-earned savings when they'd rather spend it on a trip of their own. Pressing a key makes your man move to the left. If no key is pressed he automatically moves to the right. The more ambitious can speed up the game by adding extra **SYS 674** to **line 150**.

The program loads in two parts: type-in and save them separately. Then load and run the first part before loading the second.

by Simon Veryard

Part One

```
0 REM ***************
1 REM *             *
2 REM * UREKA  1984 *
3 REM *             *
4 REM * BY :- SIMON *
5 REM *             *
6 REM *   VERYARD   *
7 REM *             *
8 REM ***************
9 REM
10 FORI=7168TO7679:POKEI,PEEK(25600+I):NEXT
15 FORT=674TO757:READA:POKET,A:NEXT
20 FORT=0TO9
30 FORI=7168+(8*T)TO7168+(8*T)+7
40 READA:POKEI,A:NEXTI,T
50 POKE56,28
100 DATA 162,0,189,118,31,157,96,31
101 DATA 232,224,110,208,245,162,255,189
102 DATA 52,30,157,74,30,202,224,255
103 DATA 208,245,162,52,189,0,30,157
104 DATA 22,30,202,224,255,208,245,169
105 DATA 7,174,60,3,157,73,31,165
106 DATA 197,201,64,208,15,169,0,232
107 DATA 157,73,31,224,22,208,2,162
108 DATA 2,76,242,2,169,1,202,157
109 DATA 73,31,224,1,208,2,162,21
110 DATA 142,60,3,96
111 DATA 8,29,9,78,72,120,8,255
112 DATA 16,184,144,114,18,30,16,255
113 DATA 203,203,170,0,2,135,183,255
```



```
114 DATA 60,24,102,239,199,239,195,126
115 DATA 129,195,102,60,24,126,60,24
116 DATA 66,36,60,90,126,102,60,102
117 DATA 219,231,219,255,255,24,36,126
118 DATA 0,0,0,0,0,0,0,255
119 DATA 24,60,126,171,213,255,255,231
120 DATA 60,60,126,255,231,66,36,24
200 POKE36879,25:POKE36865,160:POKE36869,255
215 PRINT"[CLS][REV][BLK][CR][GRN]UREKA [BLK]- VIC 20 3.5K"
220 PRINT"[REV][PUR][CR][5G<U]"
225 PRINT"[REV][RED][CD]YOU ARE ON THE PLANET THORN COLLECTING MONEYTO BUY YOURS
ELF";
230 PRINT" ROCKETRIDES AROUND THE ULTRASPACE!!"
235 PRINT"[REV][CD][BLK]BEWARE!! [RED]THE PLANET[3SPC]RAINS KILLER THUNDER[2SPC]
BOLTS, AND WATCH OUT ";
240 PRINT"[REV] FOR THE MUGGER CYLONS."
245 PRINT"[REV][7CR][12G<@]"
250 PRINT"[REV][BLK][2CR]P[RED][4CR][G<G][OFF][CYN]D[REV][RED][9SPC][G<M]"
255 PRINT"[REV][BLK][2CR]R[RED][4CR][G<G][10SPC][G<M]"
260 PRINT"[REV][BLK][2CR]E[CR]K[RED][2CR][G<G][7SPC][OFF][GRN]C[REV][RED][2SPC][
G<M]"
265 PRINT"[REV][BLK][2CR]S[CR]E[RED][2CR][G<G][10SPC][G<M]"
270 PRINT"[REV][BLK][2CR]S[CR]Y[RED][2CR][G<G][10SPC][G<M]"
275 PRINT"[REV][7CR][G>L][BLK][5G<@][OFF]A[REV][4G<@][RED][G>@]"
280 PRINT"[REV][BLK][2CR]A[RED][4CR][12G>L][G<G]"
285 PRINT"[REV][7CR][2G>L][OFF]E[REV][9G>L][G<G][HOM]"
290 FORT=160TO38STEP-1:POKE36865,T:FORI=1TO30:NEXTI,T
300 GETA$:IFA$=""THEN300
305 POKE36869,240:PRINT"[CLS]NOW LOAD MAIN PROGAM."
```

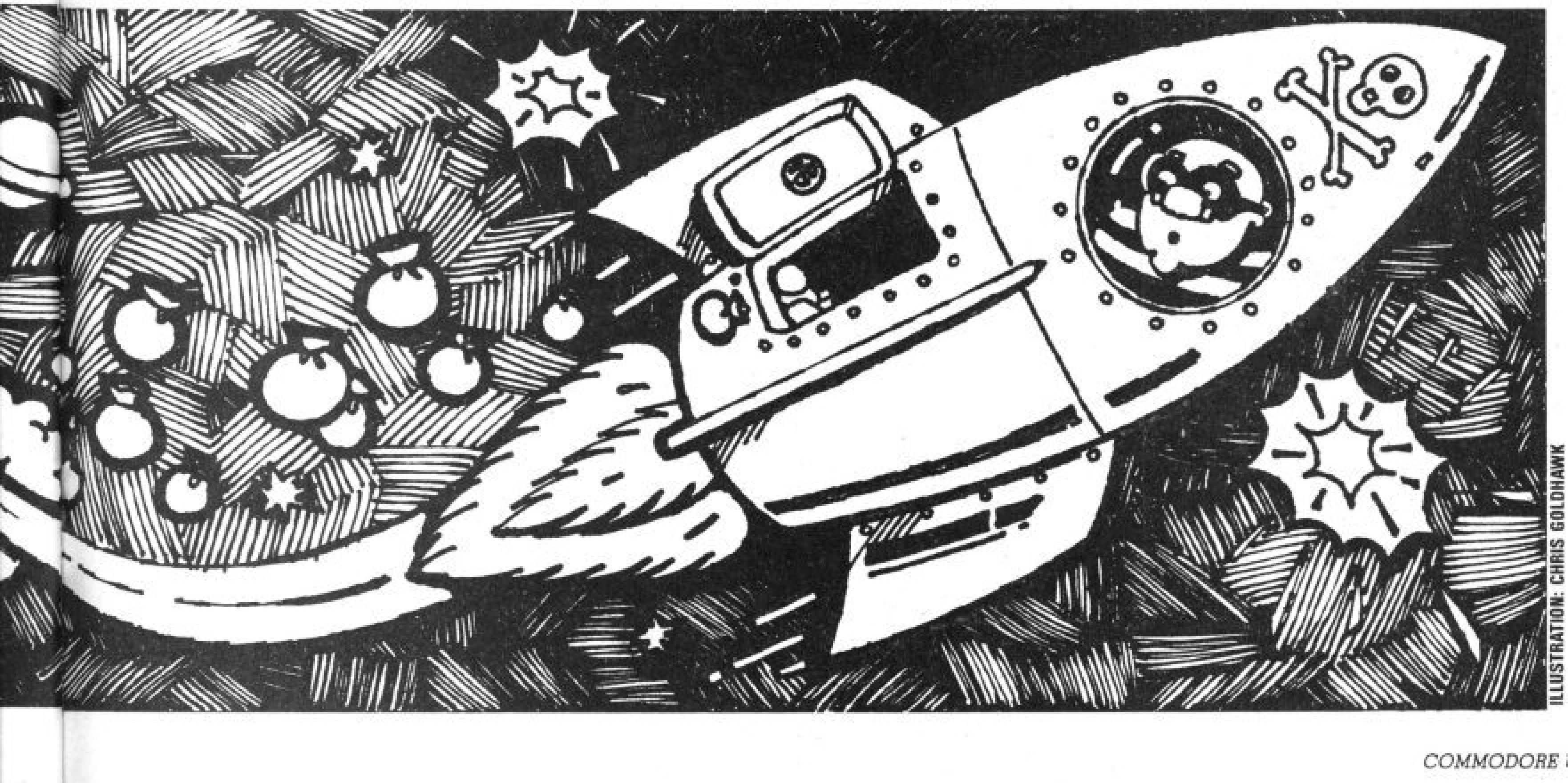


ILLUSTRATION: CHRIS GOLDHAWK

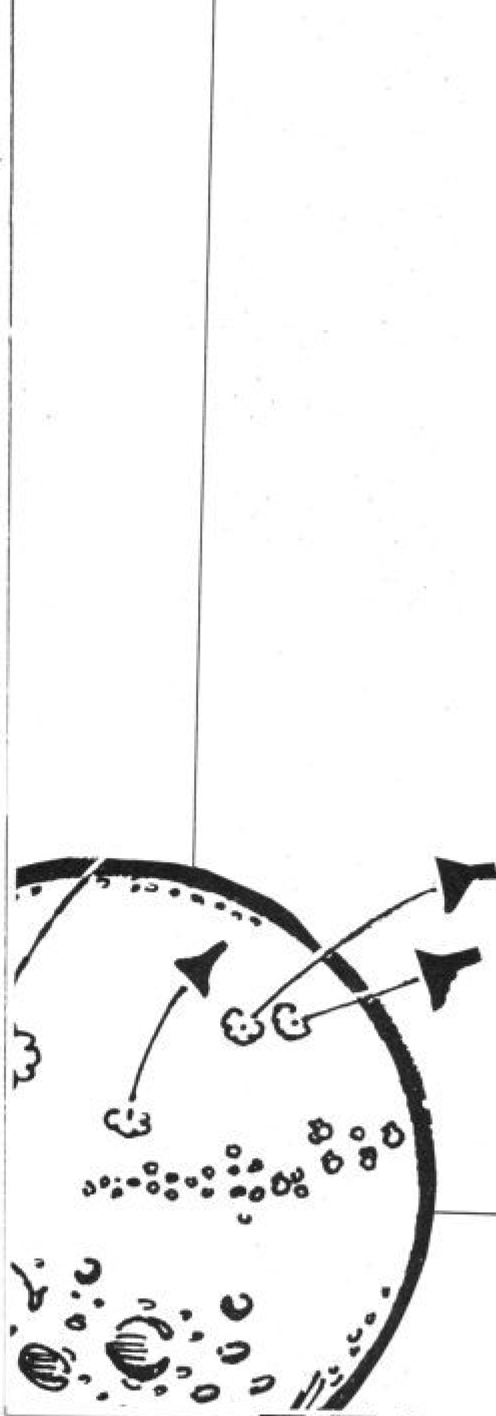
Victuals

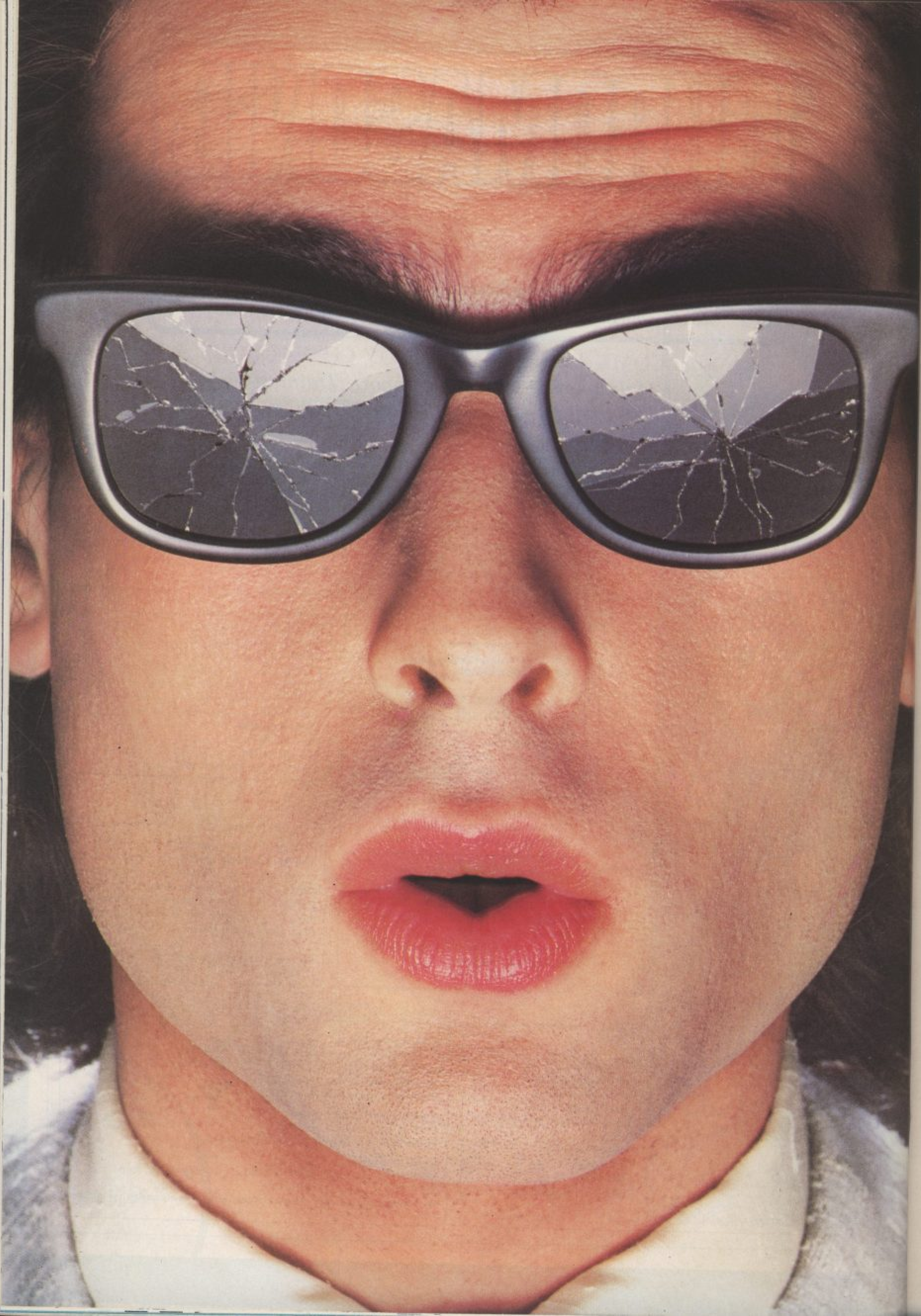
Part Two

```
5 I=36874:POKE828,15
10 POKES-7,255:M=8174
15 DEF FNR(X)=255-RND(1)*25
20 POKES+3,25:POKE36878,15
30 PRINT"[CLS]":W=3:A=2:Z=1:K=5
35 A$="[HOM][BLK][22CD]"
40 FORT=38400TO38421
50 FORI=0TO23:IFI<16THENPOKET+22*I,A:NEXTI
51 POKET+22*I,0:POKET+22*I-30720,204:NEXT
55 A=A+1:IFA=6THENA=2
56 NEXTT:A=0
60 FORT=38730TO38751
70 POKET,0:POKET-30720,7:NEXT
75 B$=" [CD][CL]H[CD][CL]F[CD][CL][RED]I"
76 D$="SORRY SON'E"
80 DEF FNA(X)=INT(RND(1)*19)+1
85 DEF FNB(X)=PEEK((7987)+PEEK(828))+PEEK((8031)+PEEK(828))
90 A=A+1:IFA>=WTHENPOKE7702+FNA(X),3.5+RND(1):A=0
100 B=B+1:IFB>=W+KTHENPOKE8119+FNA(X),5:B=0
120 IF FNB(X)<>23ATHENGOTO200
130 PRINTA$"[REV][RED]SCORE[OFF]"SC"[HOM]"
140 POKES,FNR(X):POKES,0
150 S=36874:POKE8010,7:POKE8031,7:GOTO70
200 IFFNB(X)=207ORFNB(X)=8THEN400
210 IFFNB(X)=208ORFNB(X)=9THENGOSUB500:Z=17:GOSUB510:GOSUB535:GOSUB600:GOTO700
220 IFFNB(X)=37THEN300
300 FORT=255TO128STEP-1
305 POKES,T:POKES+3,T
310 NEXT:POKES+3,25:POKES,0
315 POKE8007+PEEK(828),7
320 POKE828,INT(RND(1)*21)+1
325 FORT=8174TO8184:POKET,204:POKET+30720,0:NEXT
330 M=8174:GOTO130
400 POKEM,3:POKEM+30720,5:M=M+1
405 FORT=128TO254
410 POKES-1,T:NEXT
415 POKES-1,0
420 SC=SC-10:IFM<>8184THEN130
425 GOSUB510:POKES+1,0
426 POKE7987+PEEK(828),32
430 FORT=PEEK(828)TO20
435 POKE8009+T,0
436 POKES,FNR(X):POKES,0
440 FORI=1TO70:NEXTI
445 POKE8009+T,7:NEXT
450 Z=17:GOSUB510
455 FORT=8174TO8193
460 POKET,204:POKET+30720,3:POKES,INT(RND(1)*128)+128
465 SC=SC+10
470 PRINTA$"[REV][RED]SCORE[OFF]"SC"[HOM]"
475 FORI=1TO50:NEXTI,T:POKES,0
480 GOSUB550:GOSUB540:Z=1:F=0:GOSUB510:POKE8029,1:POKE829,19
485 Z=17:GOSUB510:GOSUB550
490 FORT=7700TO7767STEP22:POKET,32:NEXT
495 M=8174:Z=1:W=W-1:K=K-1:POKE8027,7:GOTO120
500 POKE9009+PEEK(828),2
505 POKE7987+PEEK(828),32
510 B$=" [CD][CL]H[CD][CL]F[CD][CL][RED]I"
512 FORT=ZTO20
515 POKE8030,7
520 PRINTLEFT$(A$,T)TAB(20)B$"[HOM]"
521 IFT>17THENPOKE8052+P,204:POKE38772+P,0:P=P+22
522 IFT=16THENRETURN
525 POKES+1,255-T:NEXT
530 POKES+1,0:C$=A$+"[4CU]":RETURN
535 FORT=1TO11
540 PRINTA$"[GRN][10CR]"RIGHT$(D$,T);
545 FORI=1TO100:NEXTI,T:POKE8184,32
550 B$=B$+"[CD][CL] "
555 FORT=1TO20
560 C$=C$+"[CU]"
570 PRINTC$TAB(20)B$
575 IFT>9THENPOKE8110+P,204:POKE38830+P,0:P=P-22
576 POKE8030,7:POKES+1,230+T:POKE38750,0:NEXT:POKES+1,0
577 P=0:RETURN
580 GOSUB510:Z=17:POKE829,1
600 RESTORE:V=S+2:S=S-2:FORZ=1TO11:READA,B,C:POKES,A:POKES+1,B
605 FORX=1TO15:POKEV,X:NEXT:FORX=15TO0STEP-1:POKEV,X:FORD=1TOC*.7:NEXT
610 NEXT:NEXT:POKES,0:RETURN
615 DATA215,147,90,215,3,60
620 DATA215,3,30,215,147,90
625 DATA221,7,60,219,3,30,219,147,60
630 DATA215,1,30,215,3,60
635 DATA212,3,30,215,147,120
640 RESTORE:FORT=1TO33:READA:NEXT
641 V=7:S=S-2:POKEV+2,15:FORL=0TO24
645 READP,Q:POKE36875,P:POKE36876,P
650 FORT=0TO30*Q:NEXTT
655 POKE36875,0:POKE36876,0
660 FORT=0TO10*Q:NEXTT,L:S=S+2:RETURN
665 DATA 187,4,187,4,201,2,201,4,201,2,195,2,195,2,183,2,163,2,175,6,163,1,175,1
670 DATA 183,2,195,2,195,2,201,2,195,2,183,2,163,3,175,1,183,2,183,2,175,2,175,2
,163,6
700 FORT=36TO160:POKE36865,T:POKES+1,255-T:NEXT:POKES+1,0
705 PRINT"[CLS][BLK][4CD][CR]D[REV]F DC-[OFF]R'', LOOKS L[REV]I[OFF]K[REV]E [CD]
I[OFF]"V[REV]E[OFF] WON [RED]:"
710 PRINT", [BLK] RE"]H[OFF]OW[REV]E[OFF]V[REV]E[OFF]R[3SPC][CD],OU [REV]D[D[OFF
] M[REV]A[OFF]N[REV]AGE[OFF] "C[5SPC][CD]S[REV]C[OFF]OR:PE.]E[OFF] SC"FO[REV]I[O
FFINTS,":
715 PRINT"ON [CD][9CR][23PC]:GRN]UW[REV]L[OFF]:[REV]A.OFF][BLK]"
740 IFSC>HCTHENHC=SC:SC=0
745 PRINT"[2CD][REV][CF]HIGH [OFF]:S[REV]C[OFF]OR[REV]E[OFF]"HC
750 PRINT"[2CD][CF][REV]A[OFF]NCT;REV]HE[OFF]F [REV]C[OFF]O(Y/N)?"
752 PRINT"[CD]0000000000000000000000"
755 FORT=S1TO12STEP-1:POKE36865,38:POKE36864,T:FORI=1TO30:NEXTI,T
756 FORT=8120TO8141
760 POKET,0:FORI=1TO250:NEXTI:POKET,7
765 GETA$:IFA$="N"THENEND
770 POKE36875,240+NE:NE=46
775 IFA$<>"Y"THENNE=T:GOTO756
780 IFA$="Y"THEN5

READY.
```







See Micronet 800 in action.

AVON

Bath. Boots, 1 Marchants Passage, Southgate. Tel: 0225 64402.
Bristol. Boots, 59 Broadmead, Tel: 0272 293631.
Bristol. John Lewis, Horsefair. Tel: 0272 29100.
Bristol. Laskys, 16-20 Penn Street. Tel: 0272 20421.
Keynsham. Key Computer Systems, 42b High Street. Tel: 02756 5575.
Weston-super-Mare. K & K Computers, 32 Alfred Street. Tel: 0934 419324.

BEDFORDSHIRE

Bedford. Boots, The Harpur Centre, Harpur Street. Tel: 0234 56231.
Dunstable. Dormans, 7-11 Broad Walk. Tel: 0582 38302.
Leighton Buzzard. Datasine, 59 North Street. Tel: 0525 374200.
Leighton Buzzard. Milton Keynes Music & Computers, 17 Bridge Street. Tel: 0525 382504.
Luton. Hobbyte, Unit 16, The Arndale Centre. Tel: 0582 457195.
Luton. Laskys, 190-192 Arndale Centre. Tel: 0582 38302.
Luton. Terry More, 49 George Street. Tel: 0582 23391.

BERKSHIRE

Reading. Heelas, Broad Street. Tel: 0734 559555.
Reading. Laskys, 118-119 Priar St. Tel: 0734 595459
Slough. Data Supplies, Templewood Lane, Farnham Common. Tel: 2 820004.
Slough. Laskys, 75 Queensmere Centre. Tel: 0753 78269.
Slough. MV Games, 245 High Street. Tel: 75 21594.

BUCKINGHAMSHIRE

Bletchley. R A M S Computer Centre, 117 Queensway. Tel: 0908 647744.
Chesham. Reed Photo & Computers, 113 High Street. Tel: 0494 783373.
Milton Keynes. John Lewis, 11 Field Walk, Secklow Gate East. Tel: 0908 679171.

CAMBRIDGESHIRE

Cambridge. Boots, 65-67 Sidney Street and 28 Petty Curry Street. Tel: 0223 350213.
Cambridge. Heffers Stationers, 19 Sidney Street. Tel: 0223 358241.
Cambridge. Robert Sayle, St Andrews Street. Tel: 0223 612929.
Peterborough. Boots, 40-42 Bridge Street, Queensgate. Tel: 0733 65352.
Peterborough. John Lewis, Queensgate Centre. Tel: 0733 44644.

CHESHIRE

Chester. Boots, 47-55 Foregate Street. Tel: 0244 28421.
Chester. Computer Link, 21 St Werburgh Street. Tel: 0244 316516.
Chester. Laskys, 7 The Forum, Northgate Street. Tel: 0244 317667.
Crewe. A S Wootton & Sons, 116 Edleston Road. Tel: 0270 214118.
Crewe. Midshires Computer Centre, 68-78 Nantwich Road. Tel: 0270 211086.
Ellesmere Port. R F R TV & Audio, 1 Pooltown Road, Whitby. Tel: 051-356 4150.
Hyde. C Tech Computers, 184 Market Street. Tel: 061-366 8223.
Macclesfield. Camera Computer Centre, 118 Mill Street. Tel: 0625 27468.
Macclesfield. Computer Centre, 68 Chestergate. Tel: 0625 618827.
Marple. Marple Computer Centre, 30-32 Market Street. Tel: 061-427 4328.
Stockport. National Micro Centres, 36 St Petersgate. Tel: 061-429 8080.
Stockport. Stockport Micro Centre, 4-6 Brown Street. Tel: 061-477 0248.
Widnes. Computer City, 78 Victoria Road. Tel: 051-420 3333.
Wilmslow. Wilmslow Micro Centre, 62 Grove Street. Tel: 0625 530890.

CLEVELAND

Middlesbrough. Boots, 88-90 Linthorpe Road, The Cleveland Centre. Tel: 0642 249616.

CUMBRIA

Kendal. The Kendal Computer Centre, Stramongate. Tel: 0539 22559.
Whitehaven. PD Hendren, 15 King Street. Tel: 0946 2063.
Workington. Technology Store, 12 Finkle Street. Tel: 0900 66972.

DERBYSHIRE

Alfreton. Gordon Harwood, 69-71 High Street. Tel: 0773 836781.
Chesterfield. Boots, 35-37 Low Pavement, Market Place: Tel: 0246 203591.
Chesterfield. Computer Stores, 14 Stephenson Place. Tel: 0246 208802.

DEVON

Exeter. Boots, 251 High Street. Tel: 0392 32244.
Exeter. Open Channel, Central Station, Queen Street. Tel: 0392 218187.
Plymouth. Syntax, 76 Cornwall Street. Tel: 0752 28705.
Seaton. Curtis Computer Services, Seaton Computer Shop, 51c Harbour Road. Tel: 0297 22347.
Tiverton. Actron Microcomputers, 37 Bampton Street. Tel: 0884 252854.

DORSET

Bournemouth. Brook Computers, 370 Charminster Road. Tel: 0202 533054.
Bournemouth. Lansdowne Computer Centre, 1 Lansdowne Crescent, Lansdowne. Tel: 0202 20165.
Dorchester. The Paper Shop, Kings Road. Tel: 0305 64564.

ESSEX

Chelmsford. Maxton Hayman, 5 Broomfield Road. Tel: 0245 354595.
Colchester. Boots, 5-6 Lion Walk. Tel: 0206 577303.
Grays. H Reynolds, 28a Southend Road. Tel: 0375 31641.
Harlow. Laskys, 19 The Harvey Centre. Tel: 0279 443495.
Hornchurch. Comptel Computer Systems, 112a North Street. Tel: 0402 446741.
Ilford. Boots, 177-185 High Road. Tel: 01-553 2116.
Southend-on-Sea. Computerama, 88 London Road. Tel: 0702 335443.
Southend-on-Sea. Computer Centre, 336 London Road. Tel: 0702 337161.
Southend-on-Sea. Estuary Personal Computers, 318 Chartwell North, Victoria Circus Shopping Centre. Tel: 0702 614131.

GLOUCESTER

Cheltenham. Laskys, 206 High Street. Tel: 0242 570282.
Cheltenham. Screen Scene, 144 St Georges Road. Tel: 0242 528979.
Gloucester. Boots, 38-46 Eastgate Street. Tel: 0452 423501.

HAMPSHIRE

Basingstoke. Fishers, 2-3 Market Place. Tel: 0256 22079.
Southampton. Business Electronics, Micromagic At Atkins, 7 Civic Centre Road. Tel: 0703 25903.
Southampton. Tyrrell & Green, Above Bar. Tel: 0703 27711.

HERTFORD

Hitchin. County Computers, 13 Bucklesbury. Tel: 0462 36757.
Hitchin. GK Photographic & Computers, 68 Hermitage Road. Tel: 0462 59285.
Potters Bar. The Computer Shop, 197 High Street. Tel: 0707 44417.
Stevenage. DJ Computers, 11 Town Square. Tel: 0438 65501.
Watford. Laskys, 18 Charter Place. Tel: 0923 31905.
Watford. SRS Microsystems, 94 The Parade, High Street. Tel: 0923 26602.
Watford. Trewins, Queens Road. Tel: 0923 44266.
Welwyn Garden City. DJ Computers, 40 Fretherne Road. Tel: 96 28444.
Welwyn Garden City. Welwyn Department Store. Tel: 0707 323456.

HUMBERSIDE

Beverley. Computing World, 10 Swabys Yard, Dyer Lane. Tel: 0482 881831.

KENT

Beckenham. Supa Computers, 425 Croydon Road. Tel: 01-650 3569.
Bexleyheath. Laskys, 15-16 Broadway Shopping Centre. Tel: 01-301 3478.
Bromley. Boots, 148-154 High Street. Tel: 01-460 6688.
Bromley. Computers Today, 31 Market Square. Tel: 01-290 5652.
Bromley. Laskys, 22 Market Square. Tel: 01-464 7829.
Bromley. Walters Computers, Army & Navy, 64 High Street. Tel: 01-460 9991.
Chatham. Boots, 30-34 Wilmott Square, Pentagon Centre. Tel: 0634 405471.
Sevenoaks. Ernest Fielder Computers, Dorset Street. Tel: 0732 456800.
Sittingbourne. Computer Plus, 65 High Street. Tel: 0795 25677.
Tunbridge Wells. Modata Computer Centre, 28-30 St Johns Road. Tel: 0892 41555.

LANCASHIRE

Blackburn. Tempo Computers, 9 Railway Road. Tel: 0254 691333.
Blackpool. Blackpool Computer Store, 179 Church Street. Tel: 0253 20239.
Burnley. IMO Business Systems, 39-43 Standish Street. Tel: 0282 54299.
Preston. 4Mat Computing, 67 Friargate. Tel: 0772 561952.
Preston. Laskys, 1-4 Guildhall Arcade. Tel: 0772 24558.
Wigan. Wildings Computer Centre, 11 Mesnes Street. Tel: 0942 44382.

LEICESTERSHIRE

Leicester. Boots, 30-36 Gallowtree Gate. Tel: 0533 21641.
Market Harborough. Harborough Home Computers, 7 Church Street. Tel: 0858 63056.

LONDON

W1. Computers of Wigmore Street, 104 Wigmore Street. Tel: 01-486 0373.
W1. HMV, 363 Oxford Street. Tel: 01-629 1240.
W1. John Lewis, Oxford Street. Tel: 01-629 7711.
W1. Laskys, 42 Tottenham Court Road. Tel: 01-636 0845.
W1. Lion House, 227 Tottenham Court Road. Tel: 01-637 1601.
W1. Rother Cameras, 256 Tottenham Court Road. Tel: 01-580 5826.
W1. The Video Shop, 18 Tottenham Court Road. Tel: 01-580 5380.
W1. Walters Computers, DH Evans, Oxford Street. Tel: 01-629 8800.
WC1. Transam Micro Systems, 59-61 Theobalds Road. Tel: 01-405 5240.
W5. Laskys, 18-19 Ealing Broadway Shopping Centre. Tel: 01-567 4717.
W8. Walters Computers, Barkers, Kensington High Street. Tel: 01-937 5432.
SW1. Peter Jones, Sloane Square. Tel: 01-730 3434.
SE9. Square Deal, 373-375 Footscray Road, New Eltham. Tel: 01-859 1516.
Lewisham. Laskys, 164 High Street. Tel: 01-852 1375.
SE13. Walters Computers, Army & Navy, 33 and 63 High Street, Lewisham. Tel: 01-852 4321.
SE15. Castlehurst Ltd, 152 Rye Lane, Peckham. Tel: 01-639 2205.
EC2. Devron Computer Centre, 155 Moorgate. Tel: 01-638 3339.
N7. Jones Brothers, Holloway Road. Tel: 01-607 2727.
N14. Logic Sales, 19 The Bourne, The Broadway, Southgate. Tel: 01-882 4942.
NW3. Maycraft Micros, 58 Rosslyn Hill, Hampstead. Tel: 01-431 1300.
NW4. Davinci Computer Store, 112 Brent Street, Hendon. Tel: 01-202 2272.
NW7. Computers Inc, 86 Golders Green. Tel: 01-209 0401.
NW10. Technomatic, 17 Burnley Road, Wembley. Tel: 01-208 1177.

MANCHESTER

Manchester. Boots, 32 Market Street. Tel: 061-832 6533.
Manchester. Laskys, 61 Arndale Centre. Tel: 061-833 9149.
Manchester. Laskys, 12-14 St Marys Gate. Tel: 061-833 0268.
Manchester. Mighty Micro, Sherwood Centre, 268 Wilmslow Road, Fallowfield. Tel: 061-224 8117.
Manchester. NSC Computer Shops, 29 Hanging Ditch. Tel: 061-832 2269.
Oldham. Home & Business Computers, 54 Yorkshire Street. Tel: 061-633 1608.
Swinton. Mr Micro, 69 Partington Lane. Tel: 061-728 2282.

MERSEYSIDE

Heswall. Thornguard Computer Systems, 46 Pensby Road. Tel: 051-342 7516.
Liverpool. George Henry Lee, Basnett Street. Tel: 051-709 7070.
Liverpool. Hargreaves, 31-37 Warbreck Moor, Walton. Tel: 051-525 1782.
Liverpool. Laskys, Dale Street. Tel: 051-236 3298.
Liverpool. Laskys, St Johns Precinct. Tel: 051-708 5871.
St Helens. Microman Computers, Rainford Industrial Estate, Mill Lane, Rainford. Tel: 0744 885242.
Southport. Central Studios, 38 Eastbank Street. Tel: 0704 31881.

MIDDLESEX

Enfield. Laskys, 44-48 Palace Garden Shopping Centre. Tel: 01-363 6627.
Harrow. Camera Arts, 42 St Anns Road. Tel: 01-427 5469.
Hounslow. Boots, 193-199 High Street. Tel: 01-570 0156.
Teddington. Andrews, Broad Street. Tel: 01-977 4716.
Twickenham. Twickenham Computer Centre, 72 Heath Road. Tel: 01-892 7896.
Uxbridge. JKL Computers, 7 Windsor Street. Tel: 0895 51815.

NORFOLK

Norwich. Bonds, All Saints Green. Tel: 0603 24617.

NOTTINGHAMSHIRE

Sutton in Ashfield. H N & L Fisher, 87 Outram Street. Tel: 0623 54734.
Nottingham. Jessops, Victoria Centre. Tel: 0602 418282.
Nottingham. Laskys, 1-4 Smithy Row. Tel: 0602 413049.

OXFORDSHIRE

Abingdon. Ivor Fields Computers, 21 Stert Street. Tel: 0235 21207.
Banbury. Computer Plus, 2 Church Lane. Tel: 0295 55890.
Oxford. Science Studio, 7 Little Clarenden Street. Tel: 0865 54022.

SCOTLAND

Edinburgh. Boots, 101-103 Princes Street. Tel: 031-225 8331.
Edinburgh. John Lewis, St James Centre. Tel: 031-556 9121.
Edinburgh. Laskys, 4 St James Centre. Tel: 031-556 1864.
Glasgow. Boots, 200 Sauchiehall Street. Tel: 041-332 1925.
Glasgow. Boots, Union Street and Argyle Street. Tel: 041-248 7387.

SHROPSHIRE

Telford. Telford Electronics, 38 Mall 4. Tel: 0952 504911.

STAFFORDSHIRE

Newcastle-under-Lyme. Computer Cabin, 24 The Parade, Silverdale. Tel: 0782 636911.
Stafford. Computerama, 59 Foregate Street. Tel: 0785 41899.
Stoke-on-Trent. Computerama 11 Market Square Arcade, Hanley. Tel: 0782 268524.

SUFFOLK

Bury St Edmunds. Boots, 11-13 Cornhill. Tel: 0284 701516.
Ipswich. Brainwave Micros, 24 Crown Street. Tel: 047 350965.

SURREY

Croydon. Laskys 77-81 North End. Tel: 01-681 8443.
Croydon. The Vision Store, 96-98 North End. Tel: 01-681 7539.
South Croydon. Concise Computer Consultants, 1 Carlton Road. Tel: 01-681 6842.
Epsom. The Micro Workshop, 12 Station Approach. Tel: 0372 721533.
Guildford. Walters Computers, Army & Navy, 105-111 High Street. Tel: 0483 68171.
Haslemere. Haslemere Computers, 17 Lower Street. Tel: 0428 54428.
Wallington. Surrey Micro Systems, 53 Woodcote Road. Tel: 01-647 5636.
Woking. Harpers, 71-73 Commercial Way. Tel: 0486 225657.

SUSSEX

Bexhill-on-Sea. Computerware, 22 St Leonards Road. Tel: 0424 223340.
Brighton. Boots, 129 North Street. Tel: 0273 27088.
Brighton. Gamer, 71 East Street. Tel: 0273 728681.
Brighton. Laskys, 151-152 Western Road. Tel: 0273 725625.
Crawley. Gatwick Computers, 62 The Boulevard. Tel: 0293 37842.
Crawley. Laskys, 6-8 Queensway. Tel: 0293 544622.

TYNE & WEAR

Newcastle-upon-Tyne. Bainbridge, Eldon Square. Tel: 0632 325000.
Newcastle-upon-Tyne. Boots, Eldon Square. Tel: 0632 329844.
Newcastle-upon-Tyne. Laskys, 6 Northumberland Street. Tel: 0632 617224.
Newcastle-upon-Tyne. RE Computing, 12 Jesmond Road. Tel: 0632 815580.

WALES

Aberdare. Inkey Computer Services, 70 Mill Street, The Square, Trecynon. Tel: 0685 881828.
Aberystwyth. Aberdata at Galloways, 23 Pier Street. Tel: 0970 615522.
Cardiff. Boots, 26 Queens Street & 105 Frederick Street. Tel: 0222 31291.
Cardiff. P & P Computers, 41 The Hayes. Tel: 0222 26666.
Swansea. Boots, 17 St Marys Arcade, The Quadrant Shopping Centre. Tel: 0792 43461.

WARWICKSHIRE

Coventry. Coventry Micro Centre, 33 Far Gosford Street. Tel: 0203 58942.
Coventry. JBC Micro Services, 200 Earlsdon Avenue, North Earlsdon. Tel: 0203 73813.
Coventry. Laskys, Lower Precinct. Tel: 0203 27712.
Leamington Spa. IC Computers, 43 Russell Street. Tel: 0926 36244.
Leamington Spa. Leamington Hobby Centre, 121 Regent Street. Tel: 0926 29211.
Nuneaton. Micro City, 1a Queens Road. Tel: 0203 382049.
Rugby. OEM Computer Systems, 9-11 Regent Street. Tel: 0788 70522.

WEST MIDLANDS

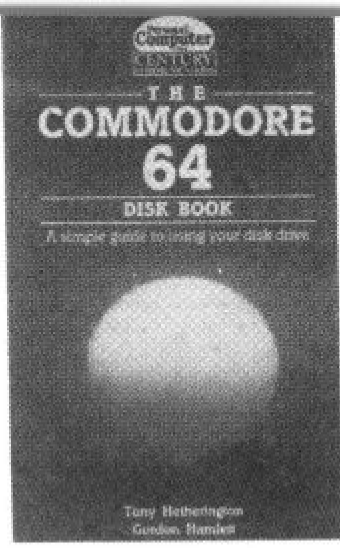
Birmingham. Boots, City Centre House, 16-17 New Street. Tel: 021-643 7582.
Birmingham. Laskys, 19-21 Corporation Street. Tel: 021-632 6303.
Dudley. Central Computers, 35 Churchill Precinct. Tel: 0384 238169.
Stourbridge. Walters Computer Systems, 12 Hagley Road. Tel: 0384 370811.
Walsall. New Horizon, 1 Goodall Street. Tel: 0922 24821.
West Bromwich. D S Peakman, 7 Queens Square. Tel: 021-525 7910.
Wolverhampton. Laskys, 2 Wulfrum Square. Tel: 0902 714568.

YORKSHIRE

Bradford. Boots, 11 Darley Street. Tel: 0274 390891.
Leeds. Boots, 19 Albion Arcade, Bond Street Centre. Tel: 0532 33551.
Sheffield. Cole Brothers, Barkers Pool. Tel: 0742 78511.
Sheffield. Laskys, 58 Leopold Street. Tel: 0742 750971.
York. York Computer Centre, 7 Stonegate Arcade. Tel: 0904 641862.



book look



The somewhat vague documentation that Commodore supplies with its products leaves the field wide open for independent authors. The disk drive manual is a prime example. So it's not surprising that enterprising authors should try to bridge this gap.
A brief introduction is followed by a chapter on powering up, although it does not include multiple connection of disk drives and printers.

Chapter two describes the construction of a diskette with the aid of an exploded diagram, and offers good advice about their care and maintenance. Following that, the Basic disk commands LOAD, SAVE and VERIFY are explained in detail, together with pattern matching, and the wedges system supplied on the Demo disk.

All the disk maintenance commands are explained, but the examples tend to be no better than those in the original manual, and are so embedded in the general text that they are difficult to identify at a glance. The authors give a warning about using the SAVE and REPLACE option of the SAVE command. They claim that there is a bug which may corrupt the disk (perhaps Tommy could comment on this).

The next three chapters cover Sequential, Random Access and Relative file systems. Error checking and the use of the status variable are introduced with short program examples, as are reading and writing files. A very useful subroutine is given to change floating point numbers into strings to reduce their storage space on disk.

The chapter on Random Access files details the mechanics of reading and writing to specific areas on the disk, and mentions that a Sequential file is required to keep track of the records created. Unfortunately no detail is given on how to create and maintain such a file.

The remainder of the book contains useful tables of commands, and comprehensive explanations of each error message.

Four useful programs are included to display the contents of a Sequential file, unscratching a SCRATCHed file, software write protection of a disk and changing the name and ID of a disk without NEWing it.

The book claims to be a simple guide to using your disk drive. It is basically a replacement for the original manual, and goes no further than explaining the workings of the disk. It will not help beginners to design file handling programs.

Ken Ryder

- **The Commodore 64 Disk Book**
- **by Tony Hetherington and Gordon Hamlet**
- **Century Publications**
- **£5.95**
- **Ian Sinclair's book represents better value.**

The second of our brace ot disk books is by Ian Sinclair. It is larger than the first, enclosing 114 pages. As a bonus there is also a section on printers. In common with the previous work the book starts with a description of the hardware and floppies, including the layout of tracks and sectors.

The LOAD, SAVE and VERIFY commands are illustrated with the use of the games disk, currently supplied free with the 1541. No mention is made of the bug reported by Hetherington and Hamlett. A short subroutine to read the error channel is included, together with a useful tip on how to load the disk directory without overwriting the program in memory.

Hexadecimal notation is clearly explained so that you can use the DISPLAY T&S program included on page 49 of the Commodore manual. Backup procedures lead logically to the file handling commands COPY, SCRATCH etc. together with the advantages of wildcards and pattern matching.

The above mentioned games disk contains a BACKUP program, without any documentation! Mr. Sinclair makes up for this deficiency by including instructions to this and the programs listed in the back of the 1541 manual. These gems are priceless.

The concept of files is introduced generally, and concentrates on Serial files specifically. Short subroutines are used to demonstrate reading, and extending a Serial file. Random Access files are relegated to an appendix, but Relative files are covered in depth. Again useful subroutines are listed. The author admits that the routines are only for learning purposes, as a Sequential file is needed to keep track of Relative files.

Unlike the first book, the next chapter carefully and clearly describes a program which creates a simple database. The system uses two Relative and one Serial file. This program may be used as a basis for something more advanced.

The final chapter is devoted to printers, describing the various types available and any interfaces needed. The Epson RX80, Juki 6100, CGP-115 and the now discontinued Commodore 1515 are individually covered. Six appendices conclude the book.

This book is for beginners; it reads easily and explains everything clearly. Unlike the previous book it actually gets down to creating a useful filing system, but if you really need Random files then look elsewhere.

Ken Ryder

- **Commodore 64 Disk Systems and Printers**
- **by Ian Sinclair**
- **Granada**
- **£5.95**
- **Worth buying**



To write programs that are actually useful and practical is the aim of this short book by Rudolf Smit. And very good it is too.

Despite the initial praise, I still feel a calendar on the loo wall and a pad on the hall table is less bother than loading a program into my 64 every time I want to check a birthday or telephone number.

The real strength of this book is not so much in its programs as in the ways they are planned and written. It is an excellent, readable introduction to structured programming with a short main line sequence and subroutines at second and third levels.

The subroutines are reached through GOSUB commands and RETURN takes the computer back to the mainline ready for the next subroutine. That is the basis of a structured program. It makes for programs that are easy to write and test, easy to follow and easy to update, alter and extend.

Don't let the apparent complexity fool you, a working knowledge of simple Basic is all that is assumed. How refreshing not to be told how to PRINT "HELLO" yet not be expected to have ready-made expertise in machine code or video chip addresses. Down to earth, clear, practical advice on planning and writing useable programs that work. A welcome addition to any "in-betweener's" bookshelf.

George Pike

- **Commodore 64 Software Projects**
- **by Rudolf Smit**
- **Melbourne House Publishers**
- **£6.95**
- **A straightforward and clear introduction to designing and writing programs. A case of 'Small is Beautiful'.**

Victuals

64 DATAMAKER — COMMODORE 64

Here's a program that converts machine-code into the DATA statements of a Basic loader.

Datamaker is a machine-code program that automatically converts machine-code into pages of Data statements. Feed in the information (the data will be printed on the screen) and press Return to enter each line.

After typing in the program, Save it (as usual) as the slightest mistake could crash the machine. The routine is completely relocatable. For example, if your source-program is located at 49152 ($C000) then locate the Datamaker at 32768 ($8000), i.e. change the Poke in line 120 from 53000 to 32768 or anywhere convenient. But remember to lower the top of Basic (Poke 56,32 in this case), otherwise any Basic




```
1 REM MC-DATAMAKER     BY M. C. HART
100 REM C-64 BASIC LOADER
110 :
120 FORJ=0 TO 169:READ X:POKE 53000+J,X:T=T+X:NEXT
130 IFT<>24979 THEN PRINT"DATA ERROR!":END
140 END
150 :
160 REM SYNTAX : SYS(LOCATION)START,END,FIRST-LINE,INCREMENT
170 :
200 DATA32,159,173,32,247,183,133,252
210 DATA132,251,32,253,174,32,158,173
220 DATA32,247,183,133,254,132,253,32
230 DATA253,174,32,235,193,134,2,165
240 DATA20,133,163,165,21,133,164,167
250 DATA0,133,88,169,147,32,210,255
260 DATA166,163,165,164,32,205,189,167
```

program will overwrite your Datamaker.

The program requires certain information to be able to carry out your wishes. It has to know the Start and End addresses of your machine-code program. It needs to know the number of the first line you want it to create, and the line increment (usually 10). This information is contained within a SYS command with the syntax: SYS (the location after the POKE in line 120) Start address, End address, First line number, Line increment (Return).

```
270 DATA32,32,210,255,169,48,32,210
280 DATA255,169,173,32,210,255,160,0
290 DATA132,97,177,251,170,152,32,205
300 DATA189,230,251,208,2,230,252,165
310 DATA254,197,252,208,7,56,165,253
320 DATA229,251,144,61,230,97,165,87
330 DATA201,9,240,9,169,44,32,210
340 DATA255,160,0,240,213,32,215,170
350 DATA24,165,2,101,163,133,163,144
360 DATA2,230,164,230,99,165,99,201
370 DATA20,208,165,32,215,170,166,251
380 DATA165,252,32,205,189,169,58,32
390 DATA210,255,166,163,165,164,32,205
400 DATA189,77,215,170,32,94,166,76
410 DATA116,164
```

For example, to convert a machine-code program, located at 49152 ($C000) to 53247 ($CFFF), to start at line 1000, with an increment of ten, enter the following:

SYS(32768)49152,53247,1000,10

The program should produce a full page of Data statements, with a pair of numbers at the bottom. Press the CLR/HOME key (unshifted), and press Return until the cursor sits below the last Data line. This enters the Data statements in the same way as if you had typed them in.

The remaining two numbers indicate the next Start address, and the next line number respectively. Enter them in the next SYS command as before, until the READY message indicates that all the Data statements have been created.

To turn these Data statements into a proper Basic loader, add the following lines:

10 FOR X=(start address)TO(end address):READ A:POKE X,A:NEXTX

In line 20, you could insert a SYS command to start the routine, or a message, "PLEASE WAIT".

by Mike Hart

Victuals

HOW TO TYPE IN VICTUALS

How we reproduce listings

We have two methods of presenting listings. When we can, we run them through a converter program that replaces the hieroglyphic control codes with more meaningful symbols.

When you see	It means...	And you...
[CU]	cursor up	press the 'cursor up' key (shifted)
[CD]	cursor down	press the 'cursor down' key
[CL]	cursor left	press the 'cursor left' key (shifted)
[CR]	cursor right	press the 'cursor right' key
[HOM]	cursor to the top lefthand corner	press the HOME key
[CLS]	clear	press the CLR key (shifted)
[DEF]	change to insert	press the INSert key (shifted)
[BLK]	change to black	press the BLK key (CTRL and 1)
[WHT]	change to white	press the WHT key (CTRL and 2)
[RED]	change to red	press the RED key (CTRL and 3)
[CYN]	change to cyan	press the CYN key (CTRL and 4)
[PUR]	change to purple	press the PUR key (CTRL and 5)
[GRN]	change to green	press the GRN key (CTRL and 6)
[BLU]	change to blue	press the BLU key (CTRL and 7)
[YEL]	change to yellow	press the YEL key (CTRL and 8)
[REV]	reverse on	press the RVS ON key (CTRL and 9)
[OFF]	reverse off	press the RVS OFF key (CTRL and 0)
[SPC]	space	press the space bar repeat the specified number of times

When you see any of the codes prefixed by a number, you must press the appropriate key the same number of times.

for example:
[3SPC]
means – press the spacebar three times

or

[5CD]
means – press 'cursor down' key five times

[G<key] **press specified key together with CBM key**
[G>key] **press specified key together with CBM key**

These listings we generally run out on a letter-quality printer, though, and conventional graphics can't be handled on a daisywheel. So some listings are done on a Commodore printer, in which case you may see the standard control codes:

```
CLR            ...   (REVERSED HEART)
HOME           ...   (REVERSED S)
RVS ON         ...   (REVERSED R)
RVS OFF        ...   (REVERSED UNDERSCORE)
CURSOR UP      ...   (REVERSED SHIFTED ●)
CURSOR DOWN    ...   (REVERSED Q)
CURSOR LEFT    ...   (REVERSED UPWARD BAR - SHIFTED H)
CURSOR RIGHT   ...   (REVERSED LEFT SQUARE BRACKET)

SET COLOUR TO
        BLACK  ...   (REVERSED SHIFTED P)
        WHITE  ...   (REVERSED E)
        RED    ...   (REVERSED £)
        CYAN   ...   (REVERSED COMMODORE-SHIFTED *)
        PURPLE ...   (REVERSED COMMODORE-SHIFTED -)
        GREEN  ...   (REVERSED UP ARROW)
        BLUE   ...   (REVERSED LEFT ARROW)
        YELLOW ...   (REVERSED PI SIGN)
THE FUNCTION KEYS CAN BE INCORPORATED INTO PRINT STATEMENTS TOO.
AS WITH THE OTHER NON-ALPHANUMERIC KEYS, THEY APPEAR AS SPECIAL"
SYMBOLS IN A LISTING
F1  ...            F2  ...
F3  ...            F4  ...
F5  ...            F6  ...
F7  ...            F8  ...
```


SPARKLE — FOR THE UNEXPANDED VIC 20

This little gem (sorry) produces a sparkle effect guaranteed to brighten up any screen.

It's quite a clever technique, too: POKEing random numbers into the re-defined graphic area of memory (7168 to 7679) produces the effect reminiscent of explosions or shimmering prizes.

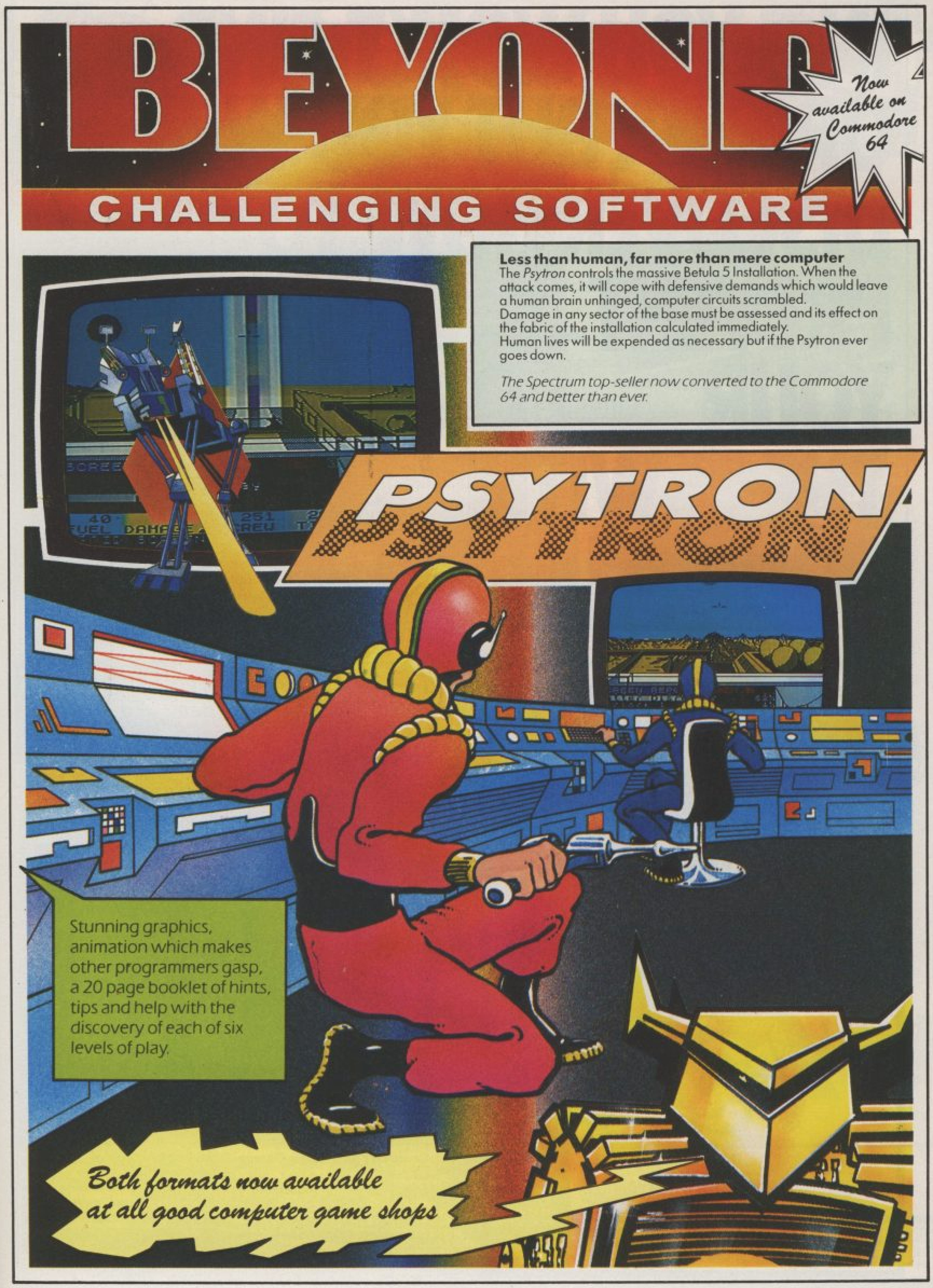
Line 5 defines the graphics, line 10 displays them on the screen. Line 15 performs the sparkle operation, and line 20 sets up an original defined character (the famous 'smiley face').

by S. Johnson



```
5 PRINT"[CLS]":POKE52,28:POKE56,28:
CLR:FORI=7168TO7183:READA:POKEI,A
:NEXT:POKE36 869,255
10 FORP=1TO50:Q=INT(RND(1)*505)+7680
:POKEQ,0:POKEQ+30720,4:NEXT
15 FORT=1TO20:FORS=7168TO7175:POKES,
INT(RND(1)*255)+1:NEXT:NEXT
20 FORS=7168TO7175:POKES,PEEK(S+8)
:NEXT
25 POKE36869,240:END
30 DATA60,66,165,129,165,153,66,60,60,
66,165,129,165,153,66,60

READY.
```



BEYOND
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Less than human, far more than mere computer
The Psytron controls the massive Betula 5 Installation. When the attack comes, it will cope with defensive demands which would leave a human brain unhinged, computer circuits scrambled.
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PSYTRON
Stunning graphics, animation which makes other programmers gasp, a 20 page booklet of hints, tips and help with the discovery of each of six levels of play.
Both formats now available at all good computer game shops

Computerama 64
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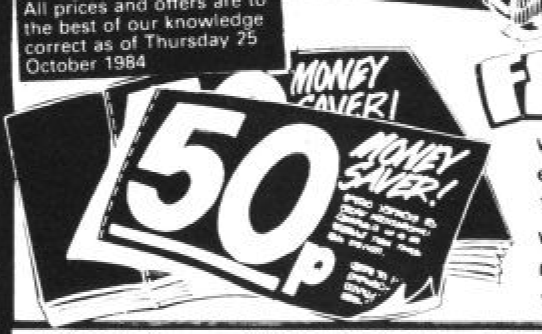
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continued on page 87

User-friendly design—Part four

Tying up the loose ends

by Chris Preston

In this last article in our series on User-Friendly Design, we are going to consider all the other 'little' things which go to make up a good program. 'Little' is in inverted commas because, as you may have noticed, these 'little' things sometimes take an awful lot of programming — which is why they tend to get neglected.

The 'Blank Screen' Syndrome

Never, ever, leave the screen blank. You should always tell the user that something is happening, even if you don't always tell him or her what it is — a user might be quite happy with 'WRITING RECORD TO DISK' but get a little worried about 'CORRECTING SOFT ERROR', or 'RETRYING FAULTY SEEK OPERATION'; so we tend not to give too much detail about them, even though they happen all the time on any disk drive. Basically, the user just wants some confirmation that the machine is doing *something*.

A little more subtle than the Blank Screen Syndrome is the nasty habit of not showing any change on the screen after a key has been pressed. If selecting option 5 on the menu means that the program has to spend five seconds calculating before displaying the result, put a message on the screen saying 'CALCULATING DEPARTMENTAL TOTALS'. Otherwise our impatient operator is going to keep on pressing the '5' button muttering "Come on you [expletive deleted] machine" and then have to wait for 50 seconds while the obedient computer calculates the totals ten times over.

Which brings us to our next topic:



Don't clear the keyboard queue

On all the Commodore machines there is a keyboard queue which allows the operator to 'type ahead' that is, to enter data on the keyboard faster than the program can accept it.

Some programmers gleefully put a spanner in the works by clearing the queue every time the program comes to a new menu; which in effect disables this facility. You can argue that this makes it easier for the first-time user to use the program, because he or she doesn't get confused if two keys are pressed by mistake. But you should remember that a first-time user is only a first-time user once: and after our user has got the hang of the program, he or she may want to rattle off half a dozen keys and then take a mouthful of coffee while the program catches up.

Research into factory working procedures has shown that machine operators are much happier if they can work at their own pace, rather than being tied rigidly to the machine's timetable. Being able to average 12 pieces per minute is much easier than *having* to do one every five seconds, even though it may boil down to the same thing in the course of a shift.

HELP screens

The information normally given on the screen should be enough for a reasonably experienced operator to use the program without any trouble. But there will always be inexperienced users; and anyhow, from time to time everybody comes to a part of the program which is used only once in a blue moon.

So we need to be able to give people an extra hand. There is always the operator's manual, of course, but that is locked up in the blue filing cabinet and only Maisie has the key and she's off sick *again* . . .

So what can we do? Press 'H' for Help and hope that the program was written by a decent programmer. A proper help facility should tell the user in some depth what options are available at this point in the program — what exactly they are, what they do, and so on.

The information would really have to be held on disk or on ROM, as loading 20KB or so of text from cassette would take rather a long time: so I suppose I'll have to relent for programmers running tape systems on a 3.5KB Vic . . .

Menus

A large part of the operation of any program typically consists of telling the program what to do next — "Print a list of all customer names and addresses", "Enter today's invoices" and so on. These 'single key' options are best handled by means of a 'menu' such as the one on page 87.

continued on page 88

SELECT ONE OF THE FOLLOWING OPTIONS:
1. UPDATE CUSTOMER FILE.
2. ENTER INVOICES AND CREDIT NOTES.
3. PRINT LIST OF ALL CUSTOMERS.
4. PRINT ADDRESS LABELS.
5. PRINT CUSTOMER STATEMENTS.
6. PRODUCE AGED DEBTORS LIST.
7. FINISH PROCESSING.
PRESS 1-7



An Aged Debtors List, by the way is not a hit list for OAPs who don't pay their bills: it's a list of all customers who owe money. It is usually arranged in columns — '1 month', '2 months', '3 months' — so that the accounts department can see who the bad payers are.

When the menu is on the screen the operator has to press only one key in the range 1 to 7 to move on to the next job — using the numeric keys means that the operator does not have to search the keyboard for the "D" key. There are cases when we *might* use letters, especially "N" and "Y"; but usually that only applies where we want the operator to stop and think (something you should normally try to discourage).

In a large program, there may be more options than will fit on to one screen. In this case we have to split the system up into a main menu and a number of sub-menus.

Handling disk errors

People are very fond of knocking CP/M's famously enigmatic disk error message "BDOS ERR ON A:". To some extent this is unjustified; after all, what else do you need to know apart from the fact that a disk error has occurred on drive A? Do you really want to know that it is a read verify error on track 15 sector 3?

What is unforgivable though is the fact that the user is not given any chance to try again. You may have put an unformatted disk in the drive instead of the correct one, or you might have put it in upside down, or you could simply have forgotten to close the drive door.

Many programs suffer from a similar problem. "FILE NOT FOUND", they say, or "WRITE PROTECT ON": and they then just stop! After *every* disk error the operator should be told what has happened (but don't try to blind the user with science) and give the option of either retrying or abandoning the operation. For instance . . .

CUSTOMER FILE NOT FOUND ON DRIVE 1.

PRESS (A) TO ABORT. OR <R TO RETRY>

The operator can now make a choice —whether to give in and press <A>, or put the right disk in the drive and press <R>. Notice that this is a case for using letters; we want the operator to think about what he or she is doing, and there is a danger from pressing the wrong one of two adjacent keys such as '1' and '2'.

This is also a case for clearing the keyboard buffer. If the operator has started to enter data beginning with an "A" he is now going to be in trouble!

At this point some programmers will be starting to huff and puff and say, "Well that can't be done in this program because at the point where the problem occurs, the program doesn't know which particular file access caused the error". Or some such feeble excuse.

If that is true, those programmers had better rewrite their programs — because they must be pretty awful! There is no excuse for not being able to recover from an error because of lack of information. All it needs is a decently-written program.

Output

The output from a program may be displayed either on the screen or the printer. The same considerations apply to both, so we'll assume that we are talking about printer output.

The printout should of course have a heading at the top of each page saying exactly what the printout is and when it was produced. For example, we may have a program to print out data from our customer file. A page heading saying "CUSTOMER FILE PRINT" is all very well if the program is going to print out all the customers; but if we have a *selective* print, which prints out only customers living in Reading who have expressed an interest in photocopiers, then the page heading (or at least the report heading) should say so. Otherwise, somebody picking up the printout could assume that *all* your customers live in the Reading area!

The layout of the data is largely a matter of common sense. If it is arranged in column format, then column headings should be printed at the top of each page. Numerical data arranged in columns should be formatted so that each figure has the same number of decimal places, and the decimal points should be aligned: *(see over)*

GOOD	BAD
0.25	0.25
1034.00	1034
0.05	.05
−1.40	−1.4

The only other point worth mentioning specifically is that the report should be tailored to suit the person who is going to read it. If we have an automatic assembly machine turning out widgets, the production manager is going to want reports on product quality and quantity so that he can be sure that he is meeting his production targets.

If 20 per cent of his production is faulty, then he is going to have to get his maintenance staff to look into the problem.

The planning department on the other hand needs reports on the costs of running the machine — the cost of the raw materials used, cost of the electricity used, the maintenance costs, general staff and administration costs — as well as the production figures. They can now assess the total cost of producing a widget and so set the selling price.

But although the planning department wants to know the production data, the production manager shouldn't get a report cluttered up with various cost figures.

Summing up

A quick summary of the most important points. Notice that many of them have reservations: do this but don't do that. It is part of the skill of programming to get the "this" right without falling foul of the "that".

1. **Make life as easy for the operator as possible. Don't assume that he is as good a typist as you, or knows as much as you.**
2. **Give the operator as many options as possible, so that he can make his own mind up about how he does his job, but don't offer unneccesary information which could confuse him.**
3. **Let the operator know that the machine is still working. Certainly never leave him with the dreaded blank screen.**
4. **Validate all input immediately and tell the operator straight away if he has made a mistake.**
5. **Make the program as easy to use for a first-time user, but, even more important, don't hold up an experienced operator.**
6. **Don't force the operator to enter information which you could calculate yourself. If possible try to work out defaults for data fields (possibly based on earlier input) so that the operator can just press <RETURN> to accept them if they are correct.**

Now go to it and right some "good" programs!





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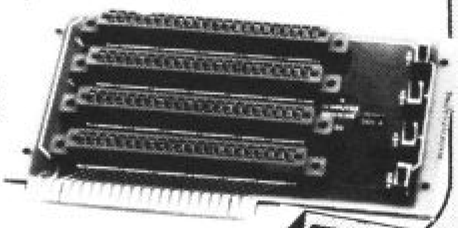


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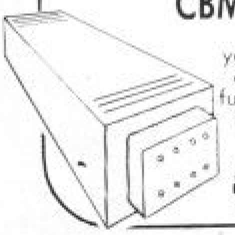
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A *STAB* IN THE BACK FOR BASIC?

An alternative language to Basic and machine code

by Andrew Collin

STAB is a programming language originally developed at Strathclyde University. One of its offshoots, STAB-1, is a language specially written for small computers. It's not only portable but it provides the ease-of-use of Basic with the speed of machine-code. STAB enthusiast Andrew Collin, who recently set up Talent Computer Systems, introduces the language and explains why Talent is using it to write games and utilities for the Commodore 64. You can't acquire it, though, for your own 64 — but that could change if there were enough demand.

If you own a Commodore 64, you won't need to be told how hard it is to program. If you're writing a small, simple program, Basic will serve you well; but as soon as you start on anything complicated, or try to use the graphics and sound facilities on your machine, Basic just gives up. You're left with a mess of PEEKs, POKEs and machine code routines which take ages to get right; and even then, your program won't run as fast as the professional stuff.

What's the secret? The wise old men of computing (actually they tend to be about seventeen, so let's say they're old in experience) will tell you that their programs are written in '*100% machine code*'. It's true that a machine code program knows no restrictions about what it can and can't do, and is a genuine way of getting the best performance from a computer; but have you ever tried writing a large program in machine code? There's so much painstaking detail to worry about, and so many pitfalls for careless mistakes, that the whole process is a return to slavery. Computers are supposed to get rid of mindless drudgery, not create it!

The solution to the problem is obvious once it's pointed out. We need a high-level language (that is, one which allows expressions, variable names, subroutines, loop structures and so on) which also gives you full control of the computer and is capable of running as fast as machine code, and they would still run just as fast. Since you could now afford to throw away bad bits of program and rewrite them, your final product



might even be better than if you had managed to write it in 100% machine code.

There are lots of computer languages around. The best-known ones apart from Basic are Fortran, Cobol, Lisp, Pascal and Prolog. Unfortunately these languages were all designed to run on mainframe computers. They don't give you full control over the machine, and some of them run very slowly (even on mainframes). The choice for micros is much more restricted.

When *Talent Computer Systems* decided to enter the home computer software market, we faced this problem in acute form. We had lots of ideas for new products, but —like other software companies— we were a bit light on geniuses to turn them into finished products. Fortunately we had good connections with the Department of Computer Science at Strathclyde University, where they have been doing research on programming methods for a number of years. One of their products is STAB-1, a computer language specially written for small machines. This language is portable, which means that you can easily run it on any computer you like.

Looking at STAB

What is STAB-1 like? At first glance, it's quite similar to Pascal. You can call your variables anything you like, and the names have limited scopes—which is the Computer Scientist's way of saying that the names only have any meaning over a restricted part of the program. This fact helps enormously with building large programs, because two or more modules can be stuck together without worrying about the fatal name clashes which so often arise if you try to do the same thing in Basic.

Another feature of STAB is that programs split naturally into procedures, each of which does one simple, well-defined job. The procedures talk to each other through a system of arguments or parameters, a bit like the user-defined functions in Basic. The key difference is that in STAB the procedures aren't limited to one line but can be as long as you like. A procedure can call another procedure. It can even call itself, which lets you use recursion.

Also, STAB is especially well adapted to handling peripherals. The way it does this is very simple. One of the 'data types' in STAB is called CHARVEC. That's not complicated, it's just like an *array* in Basic, except that each element is a character (or a byte) rather than a number. There's no limit to the length of a charvec, and it's quite easy to declare a charvec which covers the whole address space of the Commodore 64. You can then refer to any peripheral register just by using the right subscript.

Procedures with STAB

To give an example, consider the following section of code, which copies some character definitions into the RAM at address 12288. The Basic instructions are taken from the Commodore 64 Programmer's Reference Guide, page 110:

```
20 POKE 56334, PEEK(56334)
   AND 254
30 POKE 1, PEEK(1) AND 251
40 FOR I=0 TO 511: POKE I+
   12288, PEEK(I+53248): NEXT
50 POKE 1, PEEK(1) OR 4
60 POKE 56334, PEEK(56344)
   OR 1
```

The corresponding bit of STAB-1 might be:

```
routine copychars charvec source charvec destination
let i,pr=.56334
[ mem!pr and .254->mem!pr
  mem! 1 and .251->mem!1
  do i = 0(1).511 mem!(source+i)-> mem!(destination + i)
  mem!1 or 4 -> mem!1
  mem!pr or 1 -> mem!pr
 ]
```

This is an example of a procedure. It might help to understand it if we mentioned that decimal numbers are preceded with a full stop, numbers are assumed to be in the scale of 8). The shriekmark is a subscript operator, so that **mem!q** means roughly the same as MEM(Q) in Basic. Finally, -> means "**assign**". Assignment statements are written the logically correct way—work out the expression on the left, and then put it into the address on the right. Most people would say that STAB assignments are written backwards, but then most people have been brought up on illogical languages!

The procedure does nothing by itself. When called, it will move 512 characters between any two places as defined by the parameters source and destination. If you actually want the characters to be copied from 53248 to 12288, you would write a routine call like **copychars(.53248,.12288).**

The second way that STAB helps you control the machine is the provision for handling interrupts. You can write your program to include a special routine or network of routines; and you can arrange for that routine to be called automatically every time an interrupt occurs—for any reason. There is no need to write any machine code at all!

To give you a little more of the flavour of the language, here's a complete program to calculate and print prime numbers, using the method of Eratosthenes' sieve:

```
↑ Prime numbers by Eratosthenes' sieve
charvec s(.5000)
routine pr X ↑ Display value of x
if x > 0 then [pr(x/.10);printch(x rem .10+'0')]
routine main
let j,k
[2 -> j
  while j <.2500 repeat [
    if s!j = 0 then [
   2*j ->k
   while k <.5000 repeat [1 -> s!k; k+j -> k ]
                          ]
  j+1->j                  ]
↑Now print out numbers where the elements of the
↑sieve are still 0
do j=2(1).4999 [
   if s!j = 0 then [pr(j); printch/'*L') ]
                   ]
]
main
```

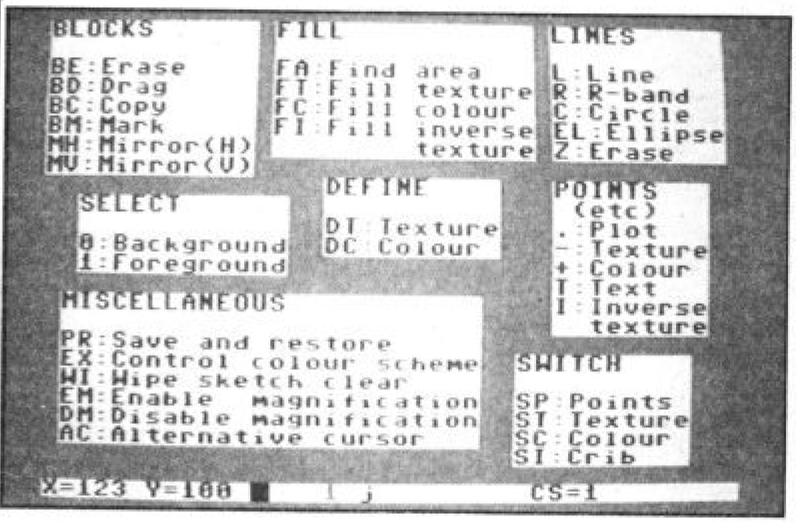
So far we've tried to convince you that STAB is a better language for writing large programs than Basic. The trouble is, you'd need a large example to prove the point! It's worth mentioning that all of Talent's products are written in STAB, and they tend to be between 1500 and 2500 lines long. Most lines contain more than one command.

Running speed

What about speed of execution? The most elegant and sophisticated language is useless if the programs just crawl along. To explain how STAB programs manage to run so quickly, I'd like to begin by reminding you of the difference between interpretation and compilation

The Basic which comes with your Commodore 64 is interpretive. This means that as you type in your program, it's put away in the memory character by character, with only a few concessions to space like abbreviated keywords. When you finally say RUN, the computer obeys your program statement by statement. In every case it begins by analysing the command, working out what it means and making sure that there are no errors. Only when the meaning is clear does the computer actually obey the command by adding numbers, displaying a string or whatever it may be.

Despite the snail's pace, interpretation has huge advantages for developing and testing programs. The original program is always in the machine, and you can list it and change it whenever you like. Another advantage is that programs in Basic tend to be compact, so that not much memory space is given over to storing them.



On the other hand, these benefits don't come free. The interpreter has to analyse every statement every time it is obeyed, so that in the loop:

10 FOR Q=1 TO 1000
20 A=A+1/Q
30 NEXT Q

the command at **line 20** is not only obeyed 1000 times, it's also analysed 1000 times; and of course the results of the analysis are the same each time round. This makes interpretation very slow, and the computer creeps along at about 1 per cent of its true potential speed.

The alternative to interpretation is compilation. Here the program is analysed once and for all, and translated into assembly code before it is run. The major advantage is that it will now run at a speed much nearer to that of machine code (not full machine code because computer-based translators — compilers as they are called — are not as clever as human coders).

The corresponding disadvantages are many. First, the translated version tends to be bulkier, to take up more memory space than the original version of the program. Second, the compiler is a complicated program, and it is difficult to shoe-horn it into a computer like the 64. (It can be done, but it would run rather slowly.) Third, program development isn't so easy because the whole program has to be retranslated if any of it is changed.

Compile or interpret?

Which is best, interpretation or compilation? There is no simple answer. Clearly, some parts of the program you are writing have to run as fast as possible to keep up with the outside world. Other parts, such as those which display screens or writing or accept typed input, have no special requirement for speed. It takes a normal person several seconds to read a screen, so it doesn't matter whether the screen appears in 1/1000 or 1/10 of a second.

STAB-1 lets you mix interpretation and compilation in the same program. When you write your program, you can choose the procedures to be translated into machine code so that they run fast. The others are interpreted and run more slowly, but then they take up hardly any room in the memory.

Would you like to get a STAB-1 compiler/interpreter for your Commodore 64? I'm afraid you can't, unless you've got a WICAT microcomputer. The STAB compiler has never actually been transferred to the 64. Instead, Talent does all its program development on the WICAT, a powerful machine with 256K of memory and a 68000 microprocessor — not the kind of machine you keep in your living room.

Programs are written and tested on the WICAT. At a later stage, they are sent down communication lines for final testing in the 64 itself or any other home computer.

Let's summarise. STAB-1 lets you write large programs which run fast and give you easy control over the hardware of the machine. Furthermore, STAB programs can be tuned so as to get the best trade-offs between space and speed, and it is easy to get the same program running on several different micros. It all sounds pretty useful. As we said earlier, STAB is not available to people who have only the Commodore 64. But this could change if there were enough demand!

Forth

The Forth Dimension:

Programming with a DIY Language

Part 4 — all about structures

by Richard G Hunt

In the previous articles in this series I have discussed briefly one of Forth's most useful structural words [DO...LOOP]. Together with [IF...ELSE...THEN] and [BEGIN] these words are the cement that binds the building blocks to provide style and form. Without them, to extend the metaphor, Forth is a house of straw!

Structure is important in any language, not least Forth. Structured programming — simplistically a buzz-phrase for thinking it out and getting it right first time — is imposed on the Forth programmer by the language. There are three very elementary rules of structured programming:

- Each operation is sequential.
- Conditional operations allow branching according to the state of conditional flags — execution of **xxx** where condition is true, **yyy** if false, and **zzz** after **xxx** or **yyy**.
- Repetitive operations execute **xxx** continually until or while a condition **yyy** is true, when execution proceeds to **zzz**.

Rule 1 is supported by any system. Rules 2 and 3 depend on suitable structural commands in the programming language. This is how they apply to Forth.

IF...ELSE...THEN

The full syntax of the Forth conditional is: (Condition) **IF** (execute true words) **ELSE** (execute false words) **THEN** (continue). As with most languages the **ELSE** part is optional. It is of course the stack that causes the order of the components. A value for comparison must be on the stack first for comparison to take place. Consider the following:

```
:GETAN$  . "DO YOU WANT
          ANOTHER GAME?
          (Y/N)"
          KEY 89=IF
          STARTPROG ELSE
          QUIT THEN ;
```

The word expects ASCII 89 ("Y") to be pressed in order to call the word that runs the game, otherwise **QUIT** is called which returns control to the keyboard. Note that any value other than "Y" ends the game, thus capturing wrong keystrokes. The dyadic (that means a set of two) relational operator '=' takes two values from the stack and leaves a flag which is ['1'] if the condition is true or '0' if false. **IF** takes the flag and causes branching to the appropriate code depending on which flag is present. It follows that **IF** can be used only within a colon definition. (This applies equally to **DO** and **BEGIN** below.) The **IF** structure is a frequent and powerful statement. It is possible to nest **IF**'s like this:

```
:MENU (input from keyboard)
  1 = if prog1 else
   2 = if prog2 else
    3 = if prog3 else
     4 = if prog4 else
      5 = if prog5   else quit
      then
     then
    then
   then
  then ;
```

This is possibly not as neat as a **CASE** structure (as in Pascal) but if you are that concerned, Forth supports other relative operators which work similarly:

[<] less than [>] greater than [0=] and [0<] both compare with 0

Other operators seemingly missing must be defined:

```
: NOT 0= ; (reverses truth of
flag)
: < > = not ;
: <= > not ;
: >= < not ;
: 0> 0< not ;
```

The DO...LOOP

This is perhaps the most common of Forth's repetitive structures. I have hinted at how it works in earlier articles and since example is an excellent teacher, here are some ways to use **DO...LOOP:**

```
: TEST cr 8 1 do 8 1 do j i * 3 .r
loop cr loop ;
: 2TEST cr 6 1 do 6 1 do j i * i *
4 .r loop cr loop ;
: 3TEST cr 6 1 do 6 1 do j i * j i
* * 4 .r loop cr loop ;
: 4TEST cr 5 1 do 5 1 do j i *
dup * * 5 .r loop cr loop ;
```

These are examples of how to create vectors and matrices in a very simplified way. It cannot compare with the conciseness of more advanced languages, but with care it can cater for most normal requirements. And few would deny that it's also much more readable! The loop limits used are suitable for the Vic's 22-column screen and may be made larger for the 64. Try to work out what each example does before you enter it, remembering that 'I' fetches the loop counter from the top of the return stack, and 'J' the next inner loop counter from the second position on the return stack. Finally on **DO** loops, it is possible to force a premature end by using **LEAVE**, once a given condition is filled.

The BEGIN structure

This structure has several possible forms which allows great flexibility:

- **BEGIN** (execute Forth words true condition) **UNTIL** (continue)
- **BEGIN** (true condition) **WHILE** (execute Forth words) **REPEAT**
- **BEGIN** (execute Forth words) **AGAIN**

The first option allows the choice of determining branches out of a loop at a given circumstance, that is when a specific condition becomes true. In a game, a BEGIN loop may determine the continuous running of the program at the highest level:

```
: RUN BEGIN PLAY DEAD
UNTIL ;
```

PLAY would invoke all the lower level words that make the game, while **DEAD** would keep track of the score or number of lives used and so on. Now try this example. You'll see that **?TERMINAL** tests for the RUN/ STOP key:

```
: 5TEST BEGIN ."HELLO"
?TERMINAL UNTIL ;
```

The second option allows the reverse condition to be determined. In this case the loop repeats (at **REPEAT**) as long as the condition remains true, or conversely when the condition becomes false. As a theoretical example this form could be used to count loops and repeat while, say, the count were less than a given number.

```
: 6TEST BEGIN ?TERMINAL
NOT WHILE ."HELLO"
REPEAT ;
```

The last option permits continuous looping unless the words **QUIT** or **ABORT** are met. Try using this:

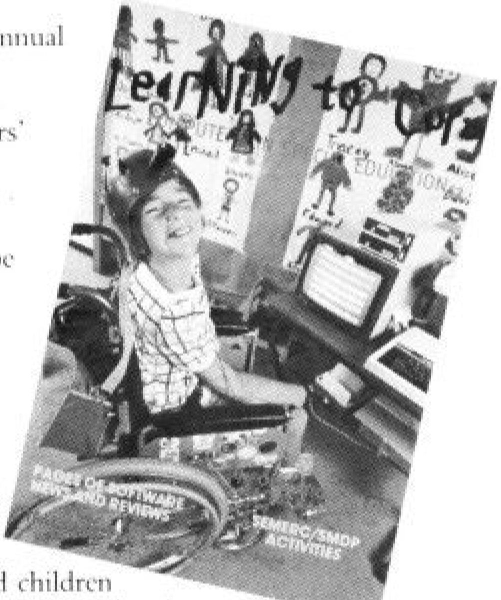
```
: 7TEST BEGIN ."HELLO"
?TERMINAL IF QUIT THEN
AGAIN ;
```

The next article will cover mainly input of numbers and strings and will conclude with a little exercise to practise what I have preached these last few months.

Learning to Cope

Learning To Cope is an annual publication compiled by journalists on Educational Computing with five years' experience in the field of education and high technology. The third issue of Learning To Cope deals with all aspects of computers in special education.

This issue gives information on the latest developments in hardware and special aids designed and adapted for physically and mentally handicapped children and adults. The progress made with micro-electronic devices helps create independence for all who use them.



A large proportion of Learning To Cope is dedicated to software, with a catalogue listing all the specially designed programs for children and adults with specific needs. It also includes a comprehensive software reviews section which examines how programs can be used as teaching and learning aids across a wide range of subjects.

Computer applications are illustrated through case studies covering such topics as computers and the blind and how computers can help to stimulate mentally handicapped children.

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Please send me a copy of Learning To Cope — Computers in Special Education.

I enclose a cheque/postal order made payable to Educational Computing for £2 (including P & P). Discounts are available on bulk orders — contact the editorial office on 01-251 6222 ext. 2475.

Name__________

Position__________

Establishment__________

Address__________

____

Signed__________

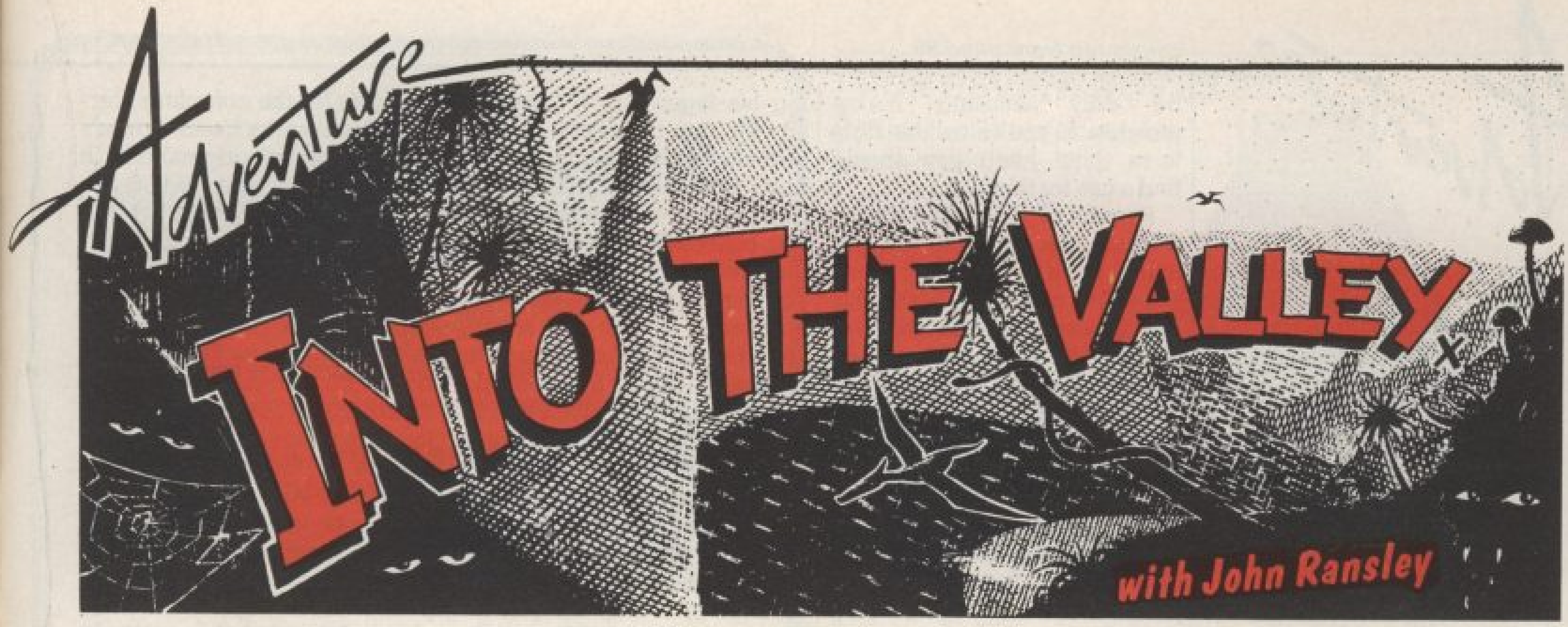
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Surprise!



COMPUTER & VIDEO GAMES

There's a surprise in store in every issue of Computer & Video Games magazine. Every month you'll find great games listings for your computer, reviews of the latest software, The Top 30 Chart, The Bugs, Arcade Action, competitions and many more fun surprises. **At your newsagent on the 16th of every month.**



Now that we've all broken into our piggy banks to buy our nearest and dearest even more spectacular Christmas presents than last year, ardent Adventurers will be keen to revive those flagging savings. What better than to solve an adventure and win a fortune into the bargain? You could win £25,000 by solving Eureka! or win a diamond by cracking the secret of Commodore's new Secret of the Stones ...

I have a suspicion that there are software snobs in just the same way as there are those cinema freaks who talk about film – and then, only if it can be viewed in a 20-seat art theatre and portrays black-and-white documentaries of the peasant struggle in nineteenth century Albania, (with Danish subtitles).

They are probably more numerous among adventure gamers, too. They're up until three in the morning waiting for just one turn at Mud and strongly hold the view that Philip Mitchell should be canonised (if such a thing is possible in the case of an Australian – let alone advisable).

They keep meticulous notes and maps, of all the adventures they play. To use HELP even once is to risk immediate excommunication from this elfin elite.

And when it comes to buying new software, they're even more critical and cynical than the sub-teens I see scanning the racks in W H Smith on a Saturday morning. They are especially wary of the hyped title – much preferring the single-figure camaraderie of a game that only seven other people will ever buy. But are they always right to be po-featured in the face of pizzaz?



Eureka – good adventure or just good hype?

Eureka! is a case in point. Wasn't there a danger that the clever teaser ads followed by enticing full-colour pages of clout and the promise of a £25,000 prize would be seen as a little too slick, a mite too glossy, for the game itself to be taken seriously? After all, there are always the headstones of Imagine and Rabbit to remind us of what happens when software advertising is consistently better than the products it promotes.

But in the case of Eureka! at least, any such suspicions must be quickly dispelled. Its pedigree helps. This 250K text and graphics skirmish with prehistoric Europe, Roman Italy, Celtic Britain, war-time Germany and the modern-day Caribbean is the work of Ian Livingstone and the talented Hungarians in Andromeda's stable who brought such a refreshing look to games like *Caesar The Cat.*

Given that the prize element is obviously important, reviewers were provided, at most, with only two of the five sections which comprise the game – and I wouldn't be at all surprised if even these didn't vary in some subtle respects from the public versions. Also unavailable at the time was the colourful booklet containing additional riddles and illustrations and which offers more clues to discovering the phone number that you must be the first to ring to claim that £25,000.

Even so, the sample more than testifies to the quality and excellence of Eureka! Putting to one side the prospect of a glittering prize – because the game must surely be judged on its intrinsic merits – Eureka! is well-furnished with challenges which are sometimes encouragingly easy – at other times, very testing.

But responses are fast and logical, and so even if your progress is brought to an abrupt halt in the path of a runaway horse or in the hull of a sinking slave ship, you should be able to figure out where you went wrong and be back on the track (or lava path, or Appian Way, or wherever) fairly soon.

The graphics are a stroke of near-genius. Instead of using hi-res screens with text windows (with all the attendant limitations), the Andromeda team have used multicoloured and multi-layered sprites to create smaller but brilliantly coloured and highly-detailed pictures which can thus be stored, displayed and changed almost instantly.

Many incorporate animated elements to add extra interest. The overall enjoyment is heightened by full use of the 64's sound potential. The marvellously strident music in the Roman segment, for example, reminded me of those 1950s epics in which Victor Mature used to fight a lion with one hand and a gladiator with the

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Adventure

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other while saving most of his energy for Gina Lollobrigida. So Eureka! is that rare thing – a hugely-hyped game that actually does live up to the promises of its advertising.

A spy from beyond

Those of us old enough to have been young enough (if you know what I mean) to be anarchic, even before the era of Monty Python, will greet with nostalgic delight the news that Antonia Prohias's duelling, wedge-nosed secret agents from the pages of *Mad* are to feature in **Spy vs Spy** from Beyond Software.

I had my wrists slapped by Beyond's Clive Bailey for daring to suggest that it might be categorised as an arcade adventure; it is an 'animated cartoon strategy game' ... I think he said. And as with that other well-known game of strategy, two can play, it should keep the joystick manufacturers happy anyway.

What do you do for an encore with one mega hit under your belt? You don't necessarily hit another vein of gold the second time around – as Melbourne House discovered after The Hobbit. Successors to that title have been adequate but hardly outstanding. Then again, you don't hack out that quality of program over a long weekend, and indeed it is almost wondrous that Philip Mitchell has polished off **Sherlock** as quickly as he has.

Sherlock homes in

Sherlock is almost a pure text adventure, though there are some graphics along the way. The real appeal of the game is the intelligence of the parser routines, which build on the facility for third-person communication and inter-action first seen in The Hobbit to an extent that will impress even Zorkists. Incidentally, it used to be only Infocom who were any good at producing supporting documentation; indeed, but the 18-page booklet that comes with Sherlock improves even on that standard.

By the way, don't make the mistake (as a friend did) of putting to one side the timetables and other scraps which come with the game, thinking them to be only amusing makeweights. If you're on the right lines (hint! hint!) you should find a use for them all.

Players of Aztec Tomb from Alligata can testify to the fact that this early effort by Tony Crowther gave little hint of his latent talents, which were to eventually surface in Loco and Suicide Express. Pretty brave of Alligata, then, to use the title **Aztec Tomb Revisited** (£7.95, £11.95 disk) for their latest adventure. Even more courageous, perhaps, of Mr Micro to promise a new graphic adventure every fortnight on Compunet, coming soon. The games will be linked, and users will be able to download them onto disk from the Software Park pages. Meanwhile,



Eureka – travel through time to win £25,000

Commodore are also said to like the idea of adding a multi-player, interactive game as a Compunet rival to Mud – originally run on Essex University's DEC 10 computer and recently acquired by Century Communications for relaunch later this year.

Two adventures of very different calibre are included in **Select One** – the compilation cassette of 12 games for the 64 selling at £12.49. Sadly, **Ring of Power**, originally published by Quicksilva at £9.95, has about as much appeal as a day-old pot noodle. It is supposed to be a graphic adventure, but all you see are crudse sprite representations of various objects or, if you type PICTURE (though the original inlay never told you this), you can call up a view of three walls marked with N, S, E or W to indicate legitimate exits. I legitimately exited after only a few minutes of disbelief.

Denis the micro-menace

Denis Through The Looking Glass is something else again; a Quill-generated text adventure in which the PM's hubby must thwart everyone and everything in the way of satisfying his legendary (?) propensity for a quick snorter. It is inoffensively entertaining and almost compensates for the inadequacies of its bedfellow in this collection. Or you can buy it separately from Applications Software at £5.50.

The brace of new graphic adventures from Audiogenic at £5.95 are – if you'll pardon the extended metaphor – a bit of a curate's egg. In **Time Traveller**, you're off to wrest the magic hourglass from the evil Graf von unpronounceable with the assistance of 1990s technology (which is like 1980s technology – only the guarantee has run out). In **The Magic Stone**, the scenario has you searching for the all-night alchemist and the means of turning lead into gold; machine coders attempting to convert Spectrum games for the 64 will be familiar with the challenge.

Both adventures accept the usual verb/noun pairs plus single-letter inputs for frequently used commands. The graphics are not at all bad, there are some nice puzzles, and the HELP option is, if anything, a little too obliging. Still, the fact that I didn't speed along suggests that the full game will in each case provide even fairly experienced adventures with a few hours of contemplation.

A few more than they might expect, in fact. This is because, apparently, neither Time Traveller nor The Magic Stone has a SAVE facility. Together with the fact that both titles take around ten minutes to load, this means that you'll have plenty of time to console yourself with the thought that there are Koala Pad outfits for the first three players of each adventure to declare the most expeditious solution. Some irony there.

Spirit of Commodore

Prizes of even more sparkle are your incentive in **Spirit of The Stones**, a kind of *Masquerade* for the computer literate which marks Commodore's first substantial original title in the genre. For your £14.95 you get a large-format book packed with full-colour illustrations, in which author John Worsley tells the tale of a fortune in diamonds hidden on the Isle of Wight. By reading the book and studying the illustrations, and by exploring the 21 locations-cum-games which feature in the accompanying software, you should be on your way to discovering and claiming one or more of the 40 diamond talismen offered as prizes – and possibly the even more valuable Great Wight Eye.

Better still, Commodore have established a royalty fund which will grow by 50p with every copy of the game purchased. So successful claimants not only get to keep the diamonds but will have at least one share out of the 50 available in the fund's total when it closes. That will be when all 41 talismen have been claimed, when the fund has reached £1 million, or in December 1993 – whichever happens first.

All clever stuff – and very fair, too; especially since you can claim by post and don't actually have to dig up the treasures. But for a concept that aspires to Williamesque sophistication – and certainly has an up-market price tag – Spirit falls a little flat when it comes to the games element. Co-author Ian Gray seems more at home with graphic adventures, such as his goodly Heroes of Karn, than with the tedious and samey arcaders he's devised here. They're a little too difficult for the younger player and probably rather too trite for the conventional adventurer to bother mastering.

Yet I've played (worse still, bought!) poorer efforts, and its two-score chances of winning a rock plus a share of perhaps £1 million might just give Spirit a place in the charts that it wouldn't otherwise deserve.

And finally, since characters from the past have figured pretty strongly in this month's column, can you deduce what (or who) Sherlock Holmes and the Goons had in common? First correct answer out of the hat – on a postcard, please, by Friday, 1st February – wins a mint fastload cassette of Storm Warrior – Front Runner's feature-packed 12-screen arcade adventure and a classic of its type.

Business

continued on page 104

ACCOUNTING FOR YOUR SINS

A layman's encounter with Commodore 64 accounts software

by Karl Dallas

*Most owners of small businesses or the self-employed shudder at the very thought of accounts; producing them is probably the most loathed chore of the business year. It's now possible for businessmen to do their accounts properly and relatively cheaply with a Commodore 64 and appropriate software. And here lies the problem. If accounting jargon leaves you cold (and it does for most of us), learning to use that accounting software may be yet another problem to contend with. Karl Dallas finds out how Gemini's **Cashbook plus VAT,** and Dialog's **Transact** and **Invostat** packages shape up to solving his financial problems.*

As a self-employed financial idiot, who got into computers mainly because I can't add two and two without getting the square root of minus one, the hardest chore of my year is the preparation of my accounts. And since HM Government devised that kind of torture known as Value Added Tax, it's become a quarterly problem, too.

In fact, when I bought my first 8K Pet back in the Seventies, I must confess that it was financial number crunching I had in mind rather than word processing, spreadsheets and databases which is what keeps it busiest now.

I've looked at some of the really powerful business packages, and they impress me mightily. But, frankly, the manuals assume so much prior knowledge of accountancy jargon (did you know Aged Debtors aren't really old aged pensioners?) and the procedures of single entry journal transactions, whereby cash recieved may be entered as *credit* to the sales account, but a *debit* to the cash account, making the whole thing harder to understand than reverse Polish notation, that they frighten me right away.

Until now, therefore, I've been doing my accounts on a spreadsheet. Every item is entered, its VAT calculated, and at the end of the month I've got a complete summary of what's been going on from which my accountant can prepare something the Inland Revenue and HM Customs and Excise will find acceptable.

With the increased use of low-priced but powerful machines like the 64, however, it's become possible for businessmen to get into doing their own accounts properly. And the software doesn't cost hundreds of pounds, any more, either.

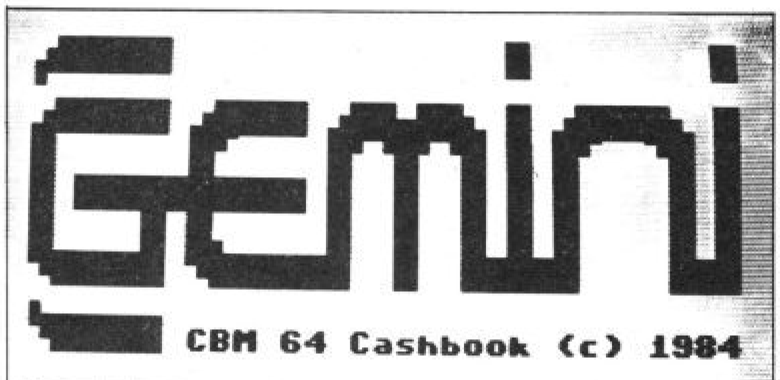
So I approached the accounts packages from **Gemini** and **Dialog** in ignorance and with trepidation, and though I ended up preferring one to the other, I won't be surprised if the professionals say I'm wrong. My fellow financial idiots may agree with me, however.

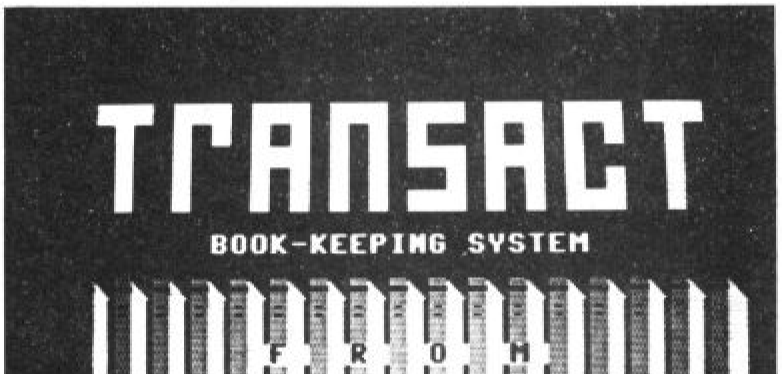
Installation

Both programs are available on disk or tape, and of course the disk version is quicker to LOAD. Gemini charge £5 extra for the disk version of their **Cashbook and VAT** package, costing £64.95. I had them on disk, but Gemini's manual says their program takes about eight minutes to LOAD from tape.

The Gemini program doesn't include an invoice generator, but it does have a special VAT utility, *VAT file*, aimed specifically at people who are on the special retailers' scheme. This would become very valuable if, as seems possible, the Government starts to levy different rates of VAT for different products.

On the other hand, Dialog's bookkeeping system is called *Transact*. It costs £30 on disk, and you can pay £30 extra for the accompanying Invostat in-





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voice and statement generator. I have my own invoice forms stored on disk as word processed pages, so I could live without the invoice generator, especially since it doesn't integrate with Transact.

I have this dream of one day typing in one set of information when I pay out for something or (more rarely) receive a payment, and have all the rest of the work done for me, but that day hasn't come yet.

Obviously, if you don't need Invostat, then just buying Dialog's Transact package could save you a lot of money.

Comparisons

When you start running the Gemini program, you're presented with a ready-formulated system into which you can start inputting data right away, with a very comprehensive list of 199 nominal account codes and titles, starting with Sales (1) and ending with Director's Loan Account. These names and codes can be changed, and there are just under 100 blank codes. If no titles are entered into these codes, then they are skipped while the system is running.

There is a set of codes for limited companies, and an alternative set for sole traders or partnerships. Obviously, both would not be required at the same time. Gemini gives a useful list of the complete set of codes in the manual.

In comparison, Dialog offer only 90 codes (probably adequate for most small businesses), and the first ten are preset as 'control accounts' to monitor the bank, cash, debtors, creditors, output and input VAT, VAT clearance etc.

The rest you have to sort out for yourself. I must confess I found the Gemini list useful in helping me work out what I might need, but a few minutes' careful thought would probably help you work it out on your own.

Once you get into recording transactions, the distinctions between the two programs becomes obvious.

The Gemini program is much more tightly structured, with certain account codes restricted to receipts, others to payments, and some to both. On the other hand, I was amazed to find it didn't calculate the VAT on each individual transaction.

I asked the Gemini people about this, and David Perkins, who helped to devise it, told me that they had been advised to do it this way by the Customs, though they might have preferred to have included automatic calculation. The problem, of course, arises if you have a mixture of taxed and zero-rated sums, or if there is more than one rate.

Certainly, one of the reasons why I wear a wrist-watch calculator is so that I can always work out how to derive the tax from the gross sum (by dividing by 7.666667, since you ask), when I am sending out invoices, because my WP program doesn't have a calculator, either. It's a little irritating, but I can live with it. Dialog, however, does give you the option of automatic VAT calculation.

After transactions have been completed, and verified, they are SAVEd to disk or tape as data files. Both programs have specimen files on disk, but of course in practice you would SAVE new files to a newly-formatted disk as soon as you started working the system.

Gemini point out, rather alarmingly, that if you should overwrite the data on the program disk, it'll be impossible to run the program. I tried backing it up (I always try backing up my program disks, even though it rarely works on the 64), but it didn't work. Oh for the days of dongles!

One of the things I preferred about the Dialog program was that it came with a small demonstration data file, which enables the first-time user to check out how it works. Gemini claimed that their data file could also be used for demo purposes, but there was no documentation about how this could be done.

Printing

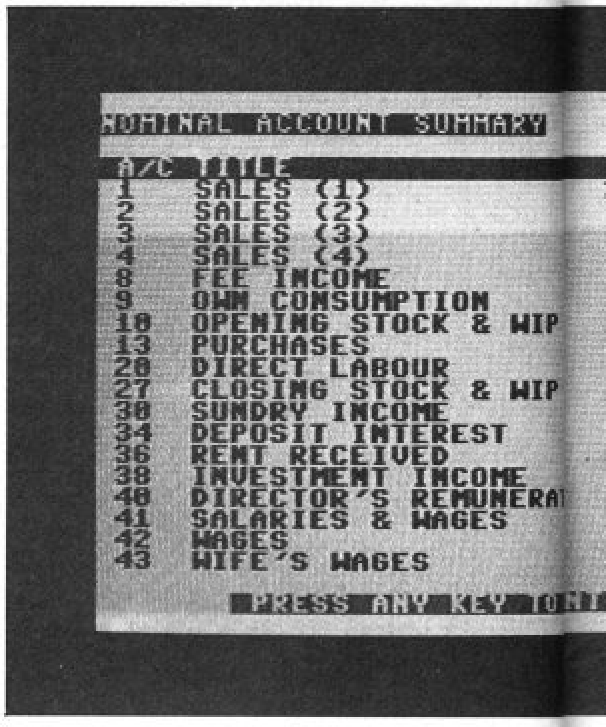
Dialog provide no information on printer configurations, and there is no facility for setting up any printer. On the other hand, printing is well documented by Gemini, who specify an 80-column printer and have a 'configure' option allowing the page length, dis/continuous paging, ASCII code for the £ sign, and device number to be altered.

The name of the company is defined while configuring the printer, surprisingly, though of course it could be incorporated in the data file name, eg "Anycompanydata".

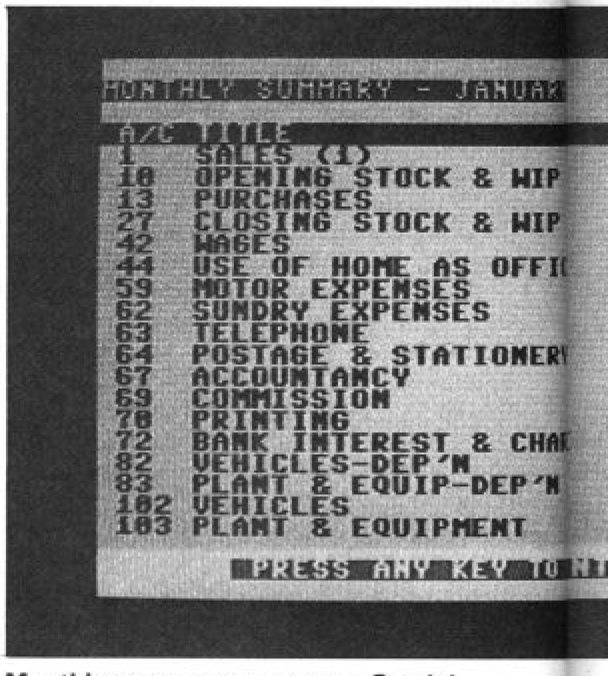
Several options require the printer to be attached, and in fact Gemini assume a hard-copy print out before shut-down (a good practice). Dialog was very unforgiving if you chose a print option by mistake without having the printer connected and will END with a 'device not present' error.

Typing CONT gives a 'Can't continue' error, and if you GOTO 0 (the ML routine opening call), the program will run again, but you've lost all the data in memory.

In fact, Gemini advise keeping the printer connected and turned on before you even RUN the program. If an interface, Interpod for example, is connected, then that should be configured before the program is RUN.



Gemini's nominal account summary



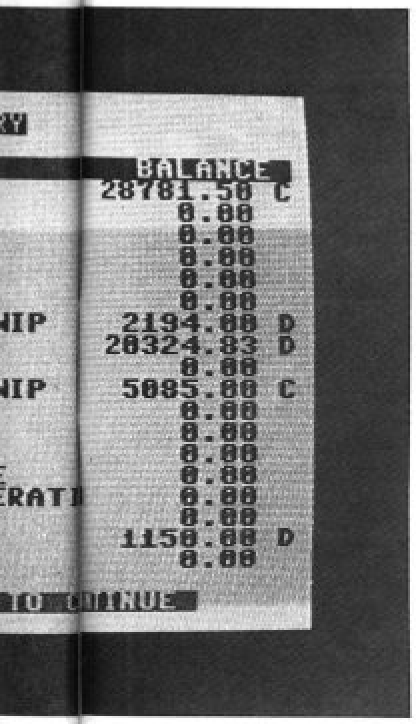
Monthly expense summary on Gemini

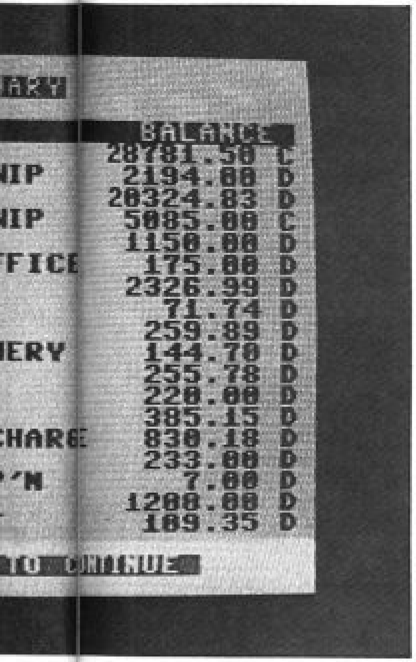
Documentation

Neither program is particularly well documented. Both have A5 booklets, the Gemini of 24 pages, the Dialog of 20.

The manual for Gemini's 'VAT file' says specifically that "this package is not intended to be a guide to the workings of Value Added Tax" and I'd say that a careful browse through any standard book-keeping tutor would be necessary to enable you to get the most out of either system. Finally, both manuals have ex-

FOR	Gemini: powerful, limited printer configuration possible
AGAINST	Gemini: no automatic calculation of VAT on each transaction
FOR	Dialog: easy for the beginner to get started
AGAINST	Dialog: less powerful, no printer documentation





tensive appendices of printed examples, which are very helpful.

Conclusions

In plumping for the Dialog package, you may realise that I have some fears that, in the long run, and after I've studied the requisite books from my local library, I might wish I'd chosen the Gemini.

It's unlikely that you'd be able to use the same data file format, if you did decide to upgrade. But I'm still going to stick to my instinct.

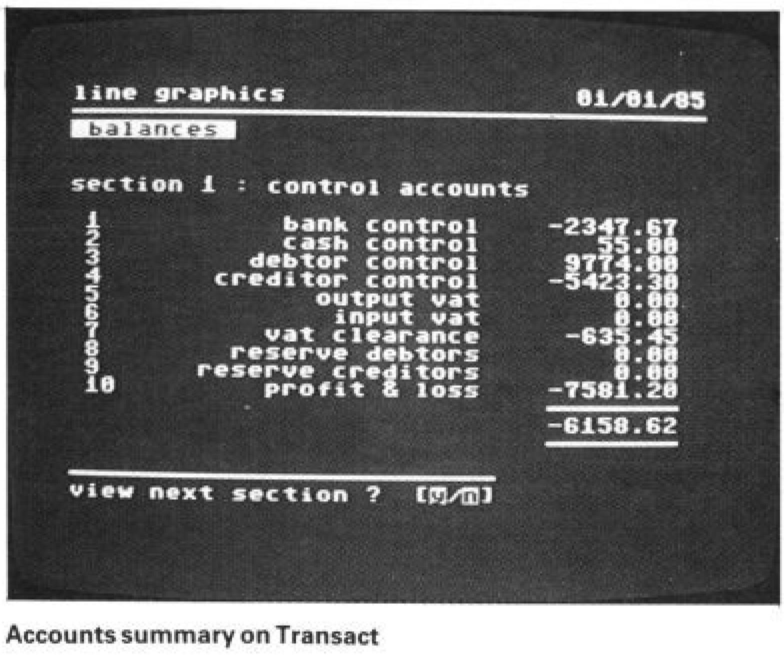
Even if I'm right in suspecting that more careful study of the Gemini package would be well worth while, life's too short. I'm not an accountant, after all, and while I'm still hoping for that elusive pot of gold at the end of the next rainbow, I'm fairly confident that I'm hardly likely to see my business expanding so much and so fast that Transact would act as a brake on further development.

But if you're starting up, have big expansion plans, and have the time to get things right first time, then take a look at Gemini. It may cost twice the money, but I suspect that it's worth it, in the long run. ●

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Dialog Software
293 Copperfield
Limes Farm Estate
Chigwell, Essex



Accounts summary on Transact



Write away

Adventure nut

I am writing to you from Sydney, Australia. I am a regular reader of your excellent magazine and I have found it very helpful in assisting me to learn more about my Commodore 64. Even though the advertisements aren't any good over here, I still love to read the articles and programs.

I am a crazed adventure game addict and currently have two games that I am hopelessly stuck on. Perhaps you or some of your readers could give me some help. The first one is "Heroes of Karn". How in heaven's name does one kill the pirate, and what will kill or disable the serpent? Secondly, is "The Secret of Barstow Manor", I'm in the stone cell and can go no further. Help!

M Stuckey, 601 Marampo Street, Marayong 2148, NSW, Australia.

Can any Karn or Secret solvers put this Antipodean Adventurer on the right track?

ZX Printerface tip

I am sure that some Vic users have the Softex Computers interface which connects the Vic-20 to the ZX printer and would welcome some information regarding it.

Whilst writing a machine-code screen dump for the set-up, I discovered that the Printerface software uses locations 251 and 254 while printing. Thus, I had to find some other zero page locations for my program to use. I have found that locations 97-102 and 105-110 can be used temporarily.

Also ZX printer users will have noticed that, sometimes, the device will print illegibly. This has a very simple cure. Just feed some paper through before doing any printing and after tearing any paper off.

M J Davies, The Waverley, 79 Rhosmaen Street, Llandeib, Dyfed, Wales.

Teach-yourself Victuals

First off may I point out that I'm rather new to the world of computers and I'm still finding my way around the programs. However I must point out that your magazine is just what's wanted for someone starting up with computers.

It's not full of very advanced programs, not over filled with advertisements (as some magazines are), it gives us a very good magazine that covers a wide slice of computing.

I Have now found the one magazine I want out of the hundreds that find their way on to the newsagents' shelves. Commodore User is a must if you wish to get to grips with your 64 or Vic-20.

The only thing I would ask for is some small programs that are of an educational kind to be added to the library of all those fathers who utter the excuse, "It's for my children". Maths, spelling, Highway-code – Green Cross code – anything as long as it's of use for the children.

If you have any readers out there that may be able to help I would like to hear from them. Keep up the good work.

L A Hutchings, PO Box 48, Derby DE6 6QP.

As you probably know, there's an increasing amount of good and cheap educational software now available for the Commodore 64 (we're reviewing a huge batch in this issue). We don't publish educational Victuals for the simple reason that we rarely receive any. It's up to you to write it and send it ...

Help for the handicapped

I enjoyed reading my first copy of Commodore User. Can I suggest that you allow one page for your magazine to tackle the problems of the mentally and physically handicapped Commodore user? There is a drastic need for up-to-date information in the highly specialised field, both from teachers of the metally handicapped and parents, of which I am one.

My son is a 5½ years old Downs Syndrome child. He copes well with the Commodore keyboard, but finds that most games on the market are too sophisticated for him to master. He requires programs which build up very slowly as his thought patterns and reactions are slower.

I urgently require a list of suppliers of suitable software. Can you help? Looking forward to hearing from you.

H Forsyth, 10 Balgibbon Drive, Callander, Perthshire FK17 8EU.

Worthwhile suggestions of this kind are always welcome. Trouble is, we don't really know how many mentally or physically handicapped users of Commodore computers there are out there. We need you to write in and tell us. Meanwhile, can any software suppliers offer any suggestions to Helen Forsyth?

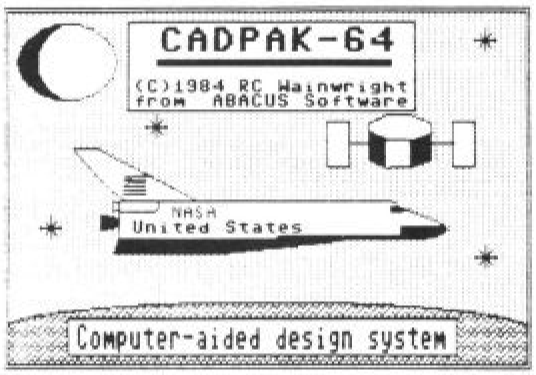
Send your letters to: Write Away, Commodore User, 30/32 Farringdon Lane, London EC1 3AU.

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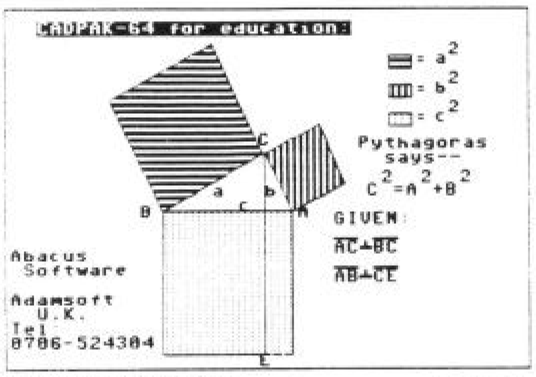
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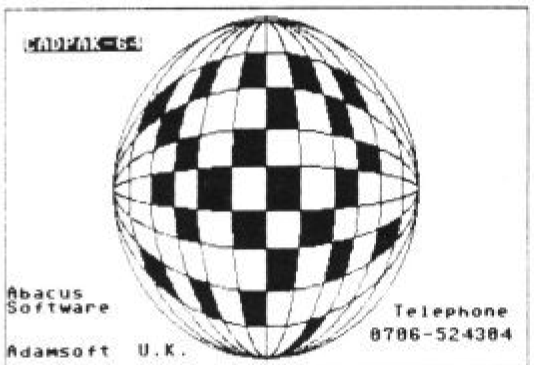
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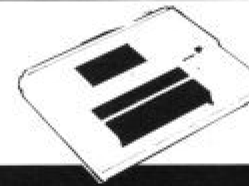
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Having finished his Home Control series last month, Chris Durham has put away his soldering iron only to start wiring up his house. That sounds alarming, and it is. He's installed a burglar alarm that's controlled by either a Vic or Commodore 64. The system is called Sentinel, from Micro-Security, and you can install it yourself for just under £100. Not only that, it can also be used as the basis for controlling other devices.



It's a fair cop?

The Sentinel burglar alarm reviewed

Last month I briefly touched on the subject of home security when I covered possible uses for the input board. Micro-Security, who hail from Hampshire, have gone a stage further and actually produced a system that lets you turn your Commodore 64 or Vic-20 into a burglar alarm, complete with window sensors, pressure mats, alarm bells and cables. It can also act as a control system, turning devices on and off at preset times.

Security system components

The complete Sentinel security system consists of the Sentinel interface unit, the control program on tape or disk, an external alarm with weatherproof enclosure, internal buzzer, ten magnetic contact switches, a pressure mat, a panic button, two junction boxes and 50m of cable plus clips; everything you need to set up your own burglar alarm system. The cost is £99.00 excl VAT, comparable to many similar self-contained alarm systems.

As with any DIY security system, the first thing to do is to install all the various components of the system; wiring up the windows and doors with the magnetic contact switches, setting the pressure mat in front of valuable items or at a doorway and mounting the bell, buzzer and panic switch in the appropriate places.

The cables are then taken back to the two junction boxes which terminate all the circuits and allows neat cabling between the junction boxes and the Sentinel unit itself. The Sentinel connects the User-port of the computer using a ribbon cable; and also requires to be plugged into the mains for its power supply. The instructions are straightforward and exactly the same as for any DIY system. It is the use of the supplied software that separates it from a stand-alone alarm system.

The security program

There are two modes; *security* and *control*. Although you can run the control mode on its own, the security mode incorporates both, so you can use Sentinel as an alarm system *and* as a control system. Unfortunately this is not made very clear in the instructions.

There are facilities to alter the parameters of the program, set the date and time and test the alarms; the parameters are normally set to the values you require and then the program stores them on tape or disk. When you next run the system these values are loaded in for use so you don't have to alter them each time. This is very handy, but the one exception to all this is the date. This has to be entered each time you run either of the main options. Even if you haven't switched the machine off and wish to change from security to control, or just reset one of the parameters, you have to re-input the time and date again.

I am sure it would not have been difficult to have stored the date and use the computer clock to keep track of the time even between options. Although you don't change options that often, to keep typing the date/time spoilt the otherwise well thought out menu approach, where the function keys are used to select the options.

Sounding the alarm

In the security mode the interface unit monitors two input channels; these can be either normally closed (*nc*) circuits

continued on page 110

continued from page 109

such as the magnetic switches, or normally open (*no*) circuits such as pressure mats or IR (infra-red) detectors. LEDs on the front panel of the interface show the state of each channel.

When the system is activated an 'events log' is begun. This shows the time of activation and records all events on one of three devices; TV screen, tape or disk. You are allowed 30 seconds (which you can adjust as required) to leave the building after activation. From then on anyone opening a protected door or window will trigger the computer to start a 30 second countdown. At the end of this period (also adjustable) the alarms will sound for the period of time specified in the settings (default is 20 minutes), after which time the system de-activates itself.

The delay is to allow you to de-activate the system before the alarms go off when you enter the house again. There is also a night-time mode which is designed for use when you are in the house and wish to protect yourself from forced entry. In this case there is no delay; as soon as a sensor is triggered the alarms go off. Likewise the panic switch; this will activate the alarms irrespective of the state of the program, provided the Sentinel interface is powered up. One good point is that the internal buzzer sounds if any protected windows or doors are open when you attempt to activate the system initially.

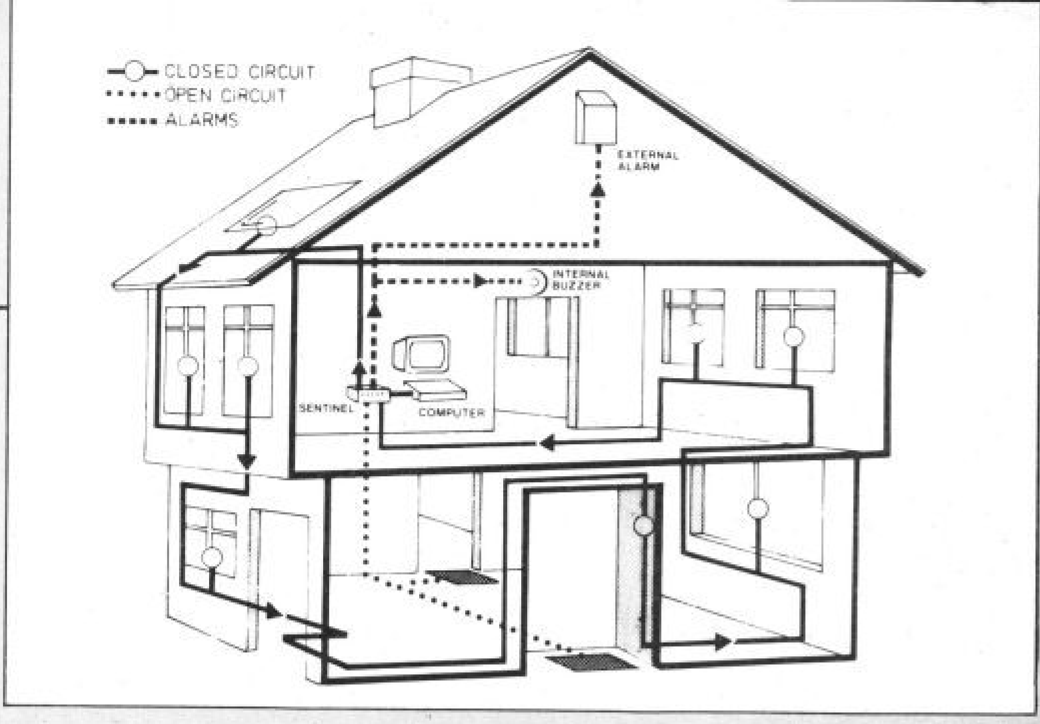
The control program

I found this slightly disappointing. There are four output channels which can be switched on or off at preset times. The settings are stored on tape or disk in the same way as the settings for the security system. You specify each of the on/off times for each channel, activate the system and it will then switch the channels as required (an LED on the front panel lights up when the channel is ON).

However, you can only specify one on/off period per 24 hours on each channel; 2 on/offs per 24 hours would be much more useful and give greater flexibility to the system.

Also it cannot handle mains control without additional components such as power relays or opto-isolated triacs. Micro-Security have said they intend to produce a mains interface and this will certainly make the system more useful, although it will also put up the price.

Although there is no way of combining the triggering of the security sensors and the switching on of the controlled outputs with the software as it is written, the two parts work simultaneously. Thus you can have lights being switched on in the house while you are away and have the security system activated. This does not preclude you writing your own software, of course, and you could devise your own control and input system; opening the front door could then turn on the kettle and the light rather than an ear-shattering alarm bell!



Drawbacks of the system

With any system which turns your computer into a dedicated controller of some sort you have to ask yourself a few relevant questions; how useful is it; does it do the job as well as a stand-alone system and is it worth the extra money?

Sentinel is let down in a number of areas: firstly, the entire system is mains powered. This can be a major disadvantage for both a security system and a control system. One glitch in the power supply large enough to trip the computer and the whole thing switches off. The 30 second delay is also time enough for the burglar to switch off the power at the mains; he doesn't have to search for the control system! Secondly, after being tripped, the security system de-activates itself. Thus if you are away for two weeks and somebody attempts a break-in two days after you leave, then even if it deters *that* burglar the house is totally unprotected from then on. Why doesn't the system reset itself, assuming the neighbours/police have re-secured the point of entry, and continue to monitor? (You could in fact modify the software to do this yourself).

Thirdly, the control system does nothing that couldn't be done equally well by a time-switch or two, with the advantage that the latter will not be affected by momentary interruptions in the power supply. Finally, here's an obvious point: while the computer is monitoring your burglar alarm system or controlling things, you can't use it for anything else.

Advantages of Sentinel

Having looked at the reasons why Sentinel is not ideal, what advantages *does* it offer? Well, as a burglar alarm system you would be using it at times when you were either out of the house or asleep, thus putting your computer to use at times when it would otherwise be lying idle. The Sentinel unit gives you a total of two input channels and six output channels; by writing your own software you could use it in a number of control applications in a more flexible manner than the supplied software permits.

It is possible to purchase the Sentinel interface without all the security hardware at a cost of £69.00 (excl VAT) thus saving £30 on items you may not want anyway. (The manuals do not show how to operate the Sentinel directly, but listing the supplied software will provide all the information you need.)

Finally, using something like the Sentinel does allow you to computerise your home to a limited degree if that's what you want to experiment with. It cannot therefore be dismissed as unsuitable for any particular purpose since different people will buy it for different reasons.

Conclusions

Within the limitations of any system that attaches to a home computer, the Sentinel does what it says it will do; it provides both a security system and a control function. For someone who wants to experiment with computer control and do something useful with it at the same time, this is a well-made, easy to use system.

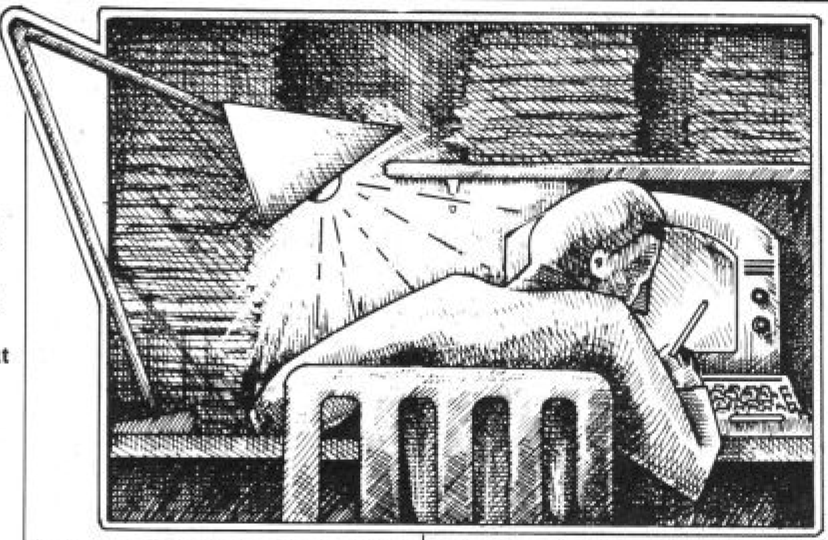
However, if you want a reliable burglar alarm to protect yourself and your property in a high risk area then you would be much better advised to invest in a stand-alone, battery backed-up system which does nothing else except guard your house. Sentinel is too dependent on a reliable and uninterrupted mains power supply; providing battery back-up for both the interface and the computer would make it very expensive.

Although the software as supplied is perfectly usable, it would benefit from some improvements; this will not be a problem for the person who wants to experiment anyway. Overall, a useful system if you are going to use it for more than just a straight burglar alarm.

Sentinel security & control interface.
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TOMMY'S TIPS

Tommy is Commodore User's resident know-all. Each month he burrows through a mountain of readers' mail and emerges with a handful of choice queries. The result, before you, is a wadge of priceless information and indispensable advice. There's even the odd useful tip as well.



***Dear Tommy,* I am the owner of a Vic-20 and the Vic 1515 printer, both of which behave impeccably.**

Last Christmas however I also bought a Commodore 64, but not before asking whether it was compatible with the Vic 1515. Yes, I was assured, there is no problem.

When, however, I linked the 64 to the printer, I found that the printer worked all right, but only if I asked it to print the simplest of instructions. With anything complicated it stopped at a different point on each occasion. As the printer still worked all right with the Vic-20, I assumed that there was something wrong with the 64, and my dealer kindly changed it. But the problem still persisted even with the new machine.

Persistent enquiries produced a magic phone number, which when I rang up I was told that the Vic 1515 is meant for the Vic-20 really. If I want to use it with the 64, before OPENing the logical file I must POKE 53265,11 to invalidate the screen, and after CLOSEing the logical file I must POKE 53265,27 to bring the screen back again. I have followed these instructions, and the printer has worked almost without problem.

Since then however I have scrutinised every item of literature I could find including "Commodore User", but I have never found this instruction about POKEing. Is there any reason for this – which means is there anything wrong with my equipment?

This is due to a timing problem on the 64. The Vic-20 peripherals, the 1540 and 1515 etc, all suffer from the same problem; the device gets out of step with the computer due to the increased work that the 64 has to do in keeping the screen up-to-date. That is the reason the 'new' 1541 disk and 1525 printer were produced; they both have new ROMs which take account of this timing problem. Even they are not completely immune; try using two 1541 disks together for example! Commodore offered a new ROM (at a cost of £25) to owners of the 1540 drive who wanted to use it with the 64. To my knowledge they have not produced one for the 1515. Turning the screen off is not an elegant solution, but the only other one is to sell your 1515 and upgrade to a newer printer.

***Dear Tommy,* I am very confused about an advert for the ZX Spectrum put in a Sunday magazine. In the advert it said "The Spectrum gives 41.5K of usable memory, more than costlier computers such as the Commodore 64 or BBC model B. So you can run bigger and better programs". I thought there was a mistake as the Commodore is 64K and the Spectrum is 48K. Please would you tell me if this is correct? I think a lot of other people will be confused and won't know which computer to buy.**

This is a classic example of companies telling people only half the story. The advert is perfectly correct if you take the amount of memory available to Basic. The Spectrum has 41.5K while the Commodore 64 only has 38.5K. This is because there is a large area of memory reserved for cartridges and the operating system etc. However, this is not the whole story because you have to take into account the sort of programs you are going to be running.

For example, the 64 can have as much as 54K available for a machine code program, because the area reserved for the Basic ROM etc can be switched out to make the memory available for use. The Spectrum cannot do this so a machine code program on the Spectrum is still limited to 41.5K.

In practice I doubt whether this is really going to be a problem unless you are going to be running some large database programs where available memory starts to become important. I suggest you should look at what you can afford, what software is available (does it do what you want?), is it easy to use and are the add-ons available and reasonably priced. Come up with a shortlist of computers and then go through and try them in the shop. You will find this a much better method of deciding on a computer than seeing which machine has the biggest byte!

***Dear Tommy,* Help! I won a Vic-20 starter pack some months ago in a competition and it has since developed a fault. As the unit is less than twelve months old, no problem you might think, but as I have no receipt none of the dealers near me want to know, so I rang Commodore but they say I need proof of purchase. Catch 22!**

I have now given up, I would like your advice as to the possible cause and probable cost (I know it's a lot to ask but I do have great faith in you).

The fault occured while running a small game during which time the program appeared to crash locking up the run/stop, restore etc. All this time the TV picture was showing. To clear the computer I switched off and on switching back on, the initial picture would not appear; the screen stays black and at the same time the CLR key is disabled completely. The fuse inside the Vic appears to be ok as the neon lamp glows when I switch on. Any ideas?

I am afraid your fault could be due to a number of things, some easy to trace and rectify and others much more difficult. To get it repaired through a Commodore dealer will probably cost around £25 since most dealers make a shipping/handling charge of around £7-£10. Why don't you write to the runner of the competition and get them to send you a letter confirming when you won the prize and then use that to try to get it repaired by Commodore. Failing that, there are a number of independent companies who repair computers. While I cannot recommend any particular one, since I haven't used them, Trident Enterprises advertise in Commodore User and charge £12.50 + parts; their phone number is 0753 48785.

***Dear Tommy,* Could you please answer the following questions? I'm thinking of buying an Epson RX-80 F/T printer to use with my Commodore 64. Do I need any additional hardware or software besides the printer before I can use it?**

Secondly, do you consider the Epson RX-80 F/T to be good for the price or have I made the wrong choice?

You will need a cable plus some form of interface to convert the Commodore output into the Centronics parallel interface format which the Epson printer uses. This can be either software interface which converts the User-port into a parallel printer port, or a hardware interface which plugs into either the serial port (like a normal Commodore printer) or into the User-port; some even do conversions of the control characters to give readable strings instead of graphics characters.

Tommy's Tips

Prices range from about £24 for the Stack software interface to £90 for the Impex hardware interface. Other interfaces include the Vic-sprint and Comprint at £50 and £62 respectively. All of these come with a suitable cable, but if you try any others check to ensure it does include a cable.

You will not go far wrong with an Epson printer. While there are similar and possibly cheaper machines available, Epson have a reputation for reliability. I use an Epson at home and at work – enough said?

Dear Tommy, Have you any ideas on a small program, that will give me a list of eleven numbers, at random, where none of the numbers are the same in any one block of eleven?

I read with interest your tips on Commodore machines each month, my only comment being that there is not enough of them.

You need to declare an array of eleven elements and then store the random numbers as they are selected. It is then a simple matter of checking the numbers you have already got and rejecting the new number if it is the same. The following short program will give you eleven random numbers between 1 and 100 with no repeats (it will work equally well with numbers between 1 and 11):

```
 10 DIM RN(11)
 20 FOR A=1 TO 11
 30 N=INT(100*RND(1)) + 1:
    FLAG = 0
 40 FOR B=1 TO A-1
 50 IF RN(B)=N THEN
    FFLAG=1: B=A: REM IF
    REPEAT THEN SET FLAG
    AND END LOOP
 60 NEXT B
 70 IF FLAG=1 THEN 30: REM
    SELECT NEW NUMBER IF
    REPEAT
 80 RN(A)=N: NEXT A
 90 PRINT"<CLR>"
100 FOR A=1 TO 11: PRINT
    RN(A): NEXT A
110 END
```

***Dear Tommy,* Can you explain how to do multiple sorts? For example, how to sort a group of approx 200 people into 6 categories, and then re-sort each category into Alpha/Num order without mixing the categories up again?**

I hope you can resolve this query.

Multiple sorts are best done using pointers. This means that instead of changing the order of the alphabetic strings, you change the order of the elements of an array that 'point to' the strings. The following short program will demonstrate this method:

```
 10 MAX=10: DIM
    CAT(6,MAX), NAMES$ (20)
 20 FOR A=1 TO 6: FOR B=0
    TO MAX
 30 CAT(A,B)=0: NEXT B,A:
    REM CLEAR ALL
    ELEMENTS OF ARRAY
 40 FOR A=1 TO 20
 50 READ NAMES$(A)
 60 C=VAL (RIGHT$
    (NAMES$(A),1)): REM
    FIGURE AT END
    DETERMINES CATEGORY
 70 IF CAT(C,0)=MAX THEN
    PRINT "OVERFLOW IN
    CATEGORY"; C:GOTO 100
 80 CAT(C,0)=CAT(C,0)+1:
    REM INCR NO OF
    POINTERS HELD
 90 CAT(C,CAT(C,0))=A
100 NEXT A
109 REM LINES 110 TO 160
    ALLOWS YOU TO CHECK
    CATEGORIES ON SCREEN
110 INPUT"WHICH CAT";X
120 IF X<0 OR X>6 THEN
    END
130 FOR A=1 TO CAT(X,0)
140 PRINT NAMES$(CAT(X,A))
150 NEXT A
160 GOTO 110
200 DATA FRED1, GEORGE3,
    ARTHUR1, MIKE2, SUE4,
    ANN5, WENDY4, KAY6,
    MARGE4, JULIE4
210 DATA BOB3, TOM3,
    CHRIS1, BERT2, JOHN2,
    MABLE6, FLO5, JENNY4,
    PAM6, JOSIE6
```

You now have six rows of numbers, each number refering to the corresponding string in **NAMES$**. By refering to the array as **NAMES$ (CAT(X,Y))** you can now do a sort on any category, without mixing them up again, by changing the order of the numbers in the relevant row of **CAT**. The ∅th element of each row of **CAT** gives you the total number of elements in that category. If you wish to access the strings in a number of different orders then just declare more arrays like **CAT**. This will also be considerably faster than moving the strings about, since you will not suffer from the dreaded garbage collection.

**Send your queries to:
Tommys Tips
Commodore User,
Priory Court,
30-32 Farringdon Lane,
London EC1R 3AU.**

CLASSIFIED

16K Vic-20 16K RAM pack. Introduction to Basic 1, £70. Games, £20. Magazines, books, super condition, £70 ono. David Nixon, 6 Wadham Street, Penkhull, Stoke-on-Trent, Staffs ST4 7HF (0782) 410628.

Commodore 3032, 3040 dual disk unit, 3022 printer. All vgc. Assembler software. Bargain £600. Tel: Brighton (0273) 771577 after 7pm.

Vic-20 unexpanded with C2N cassette, Intro to Basic Part 1, books, magazines and tapes, £130. Apply: Vogt, 10 Hunt Road, Poole, Dorset BH15 3QD.

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Disks downunder – C64 programs to swap. Write to: M Woleck, 8 Delbridge Street, North Fitzroy, 3068 Melbourne, Australia.

Vic, C2N, 16K switchable RAM, 17 games, Basic Part 1. Boxed, as new condition, £120. Phone Kevin, Chalfont St Giles 4880 (6-8pm).

At last! Economical, bi-dir RS232 adapter for Commodore 64. Comes complete with a cable & operating instructions. Specify male or female D connector, printer or modem connection. Price – just £29.95 inc VAT, P&P. Mail order only to: Fifo Computers, 1 Mitcham Road, Seven Kings, Ilford, Essex IG3 8QW. Tel: 01 590 0833.

CBM64 programs to swap. Only on disk. Over 1300 programs. Please send list to: Stefan Berglund, Sparregatan 15, 39230 Kalmar, Sweden.

32K Vic user group where are you? J Collins, 92 Grove Hill, London E18. 01-989 1277.

All 1541 users should join Club64, the international user group. For details of our excellent public domain software library contact: Brendan Conroy, 85 Upper Drumcondra Road, Dublin 9, Eire.

Vic-20/CBM64 Software Hire
No membership fee! Quality titles (eg Skyhawk, Jetpac, Flight 015) from 50p per week. Already 500 delighted members. Join them now. All games originals. Send 2 x 17p stamps for your Hirekit (please state which machine) to:
VSH(CU), 242 Ransom Road, Mapperley, Nottingham.

Vic-20 Word Processor. Victext. Powerful word processor. Facilities include:- Large text buffer, auto centre text, variable tab, insert, amend, delete, copy, move text, word count, right justify, etc. Fully menu driven with comprehensive easy-to-use instructions. Needs +16K expansion min. Great value: cassette £6.95, disk £9.45.

Vic-20 Data File. Takes the place of any card index. Facilities include:- save, loadfile, full sort, print all/part records, amend, delete records, memory remaining, etc. Needs +8K expansion min. Cassette £4.50. Both programs can be used with all direct connect Vic printers inc 1520 printer plotter. Fast delivery by first class mail. Send cheque/PO to: A&C Software, 51 Ashtree Road, Tividale, W Midlands B69 2HD.

Attention all Vic-20 and CBM64 users. Whether you're a dealer, user group, individual or software library, do you really know what commercial software there is for the Vic and the CBM64? Well it's taken us ages to come up with the document, it covers games, utilities, education, books and busines software. It gives descriptions, hardware, price, independent ratings and suppliers with addresses etc. For delivery asap send cheque/PO for £5.00 UK or £6.00 overseas to Cementls Information, Box 015.

For sale. Vic-20 cartridges; Adventureland and Voodoo Castle, £5 each or £9 both. Will swap either for Pirate Cove. Contact Darran at: 59 Kirkleatham Lane, Redcar, Cleveland.

Vic-20 for sale Vic-20, C2N cassette, much software and magazines. Quick sale £90. CBM books, Machine Code Master, £5.50, The Working CBM64, £4.50, The CBM64 Program Book, £3.50, Games for the CBM64, £1.20. Tel: Northwich 782475

CBM64 possible penpal wanted for a 12 year old boy. I have more than 150 programs to swap. Send your list to: Gisle Danielssen, Asveien 20, 4620 Vagsbygd, Norway.

Solutions to Scott Adams adventures (1-5), £1 each. Send sae to Martin Wright, "Alma", Cilcennin, Lampeter, Dyfed, Wales SA48 8RH. Tel: 0570 470362. Name solution required.

Swap. Hackers from the land down under want to swap software and info. Hundreds of good titles. Send list to: Nigel Ross, PO Box 219, Morley 6062, Perth, WA, Australia.

CBM64 owner has more than 1200 progs and wants to swap them. Please send your list, only of high quality software on disk to: Leo Rieser, Via Piffetti 27, I-10143 Torino, Italy.

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Vic-20 & CBM64 software for sale. All originals, good prices, mostly UK, some USA. For large graded lists please send sae to John Keogh, 30 Highwood Avenue, Finchley, London N12 8QP.

Vic-20, C2N recorder, Quickshot II plus Commodore joysticks, Scramble, Galaxians, plus more games. 3K Superexpander, cartridge game, book (Learn Computer Programming), manuals, dustcovers, £270. Phone 01-471 7877 after 5pm.

Vic-20 only £50 including cartridges and manuals. Versatile 16K RAMpack £15. Eighteen original games and utilities £15. Telephone Steve on Brentwood (0277) 213157 after 7pm.

CBM64, C2N cassette, 1020 printer plotter, books, magazines, lots of software, vgc, sell £360 or swap BBC 'B' with DFS. Write A Simm, 67 Kings Avenue, Flint, Clwyd CM6 5JS.

Gasilit-64, graphics/sprites musical package for CBM64. Unwanted gift. Many new commands; save pictures/tunes to tape. Send cheque or PO, £10. David Innes, 54 Sandhurst Road, Tunbridge Wells, Kent.

Vic-20 cassette C2N, Super Expander, 16K, Introduction to Basic 2, £50 worth software, books on graphics etc. All £150. N Gillon, 123 Nicholson Street, Edinburgh EH8 9ER. Tel: 031 667 8363.

Yog Limited, a strategy game for Commodore 64. You control a yoghurt making company. Features sprites, sound and turbo load, only £2.50. Contact Ian, 48 Buckingham Road, Shoreham, Sussex.

MPS 801 printer brand new, unused, unwanted, quick sale £50 ono. 81 Harrow Drive, Edmonton N9 9EQ. 01-807 1930 evenings.

Vic-20, C2N, £60; Stack Light Rifle, 3 games, £15; Stack Motherboard £15 Programmer's Aid Cartridge £10, Intro to Basic 1, £7; Programmer's Reference Guide, £5; Phone 0405 4313.

Vic-20 plus 16K, C2N cassette unit and extensive software including four Llamasoft titles one year old, excellent condition, can be sold separately, £65. Interested? Ring Beaconsfield Bucks (04946) 4630.

CBM64 software to swap, many titles including Americans. Contact Garry on 051 487 3262 or 22 Daunstey Mews, Bellevale, Liverpool L25 2TG. Especially interested in more American software.

CBM64 software to exchange, including many American titles. Disk only. Most interested in adventure games. Send your list to O Baldomero, Ryffstrasse 21, 4056 Basel, Switzerland.

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Vic-20 16K RAM four cartridges including Gorf. Twenty one games including Flight Path 737, Dungeons, Dark Dungeons, all by Anirog and others produced by them. Sell for £120.00. Phone Caunton 452 after 6pm and ask for Ian.

Vic-20 8/16K Hi-Res drawing (without Superexpander). 176x160 pixels. Draw(m/c), point(m/c), circle, elipse, spiral, triangle, square, joystick functions. Store drawings on tape, 1520 printer, and in memory (16K). Tape with machinecode routines, demo programs, sample drawings/maps, plus instructions for £2.50 from: A Blomberg, 134 Aldebury Road, Maidenhead SL6 7HE.

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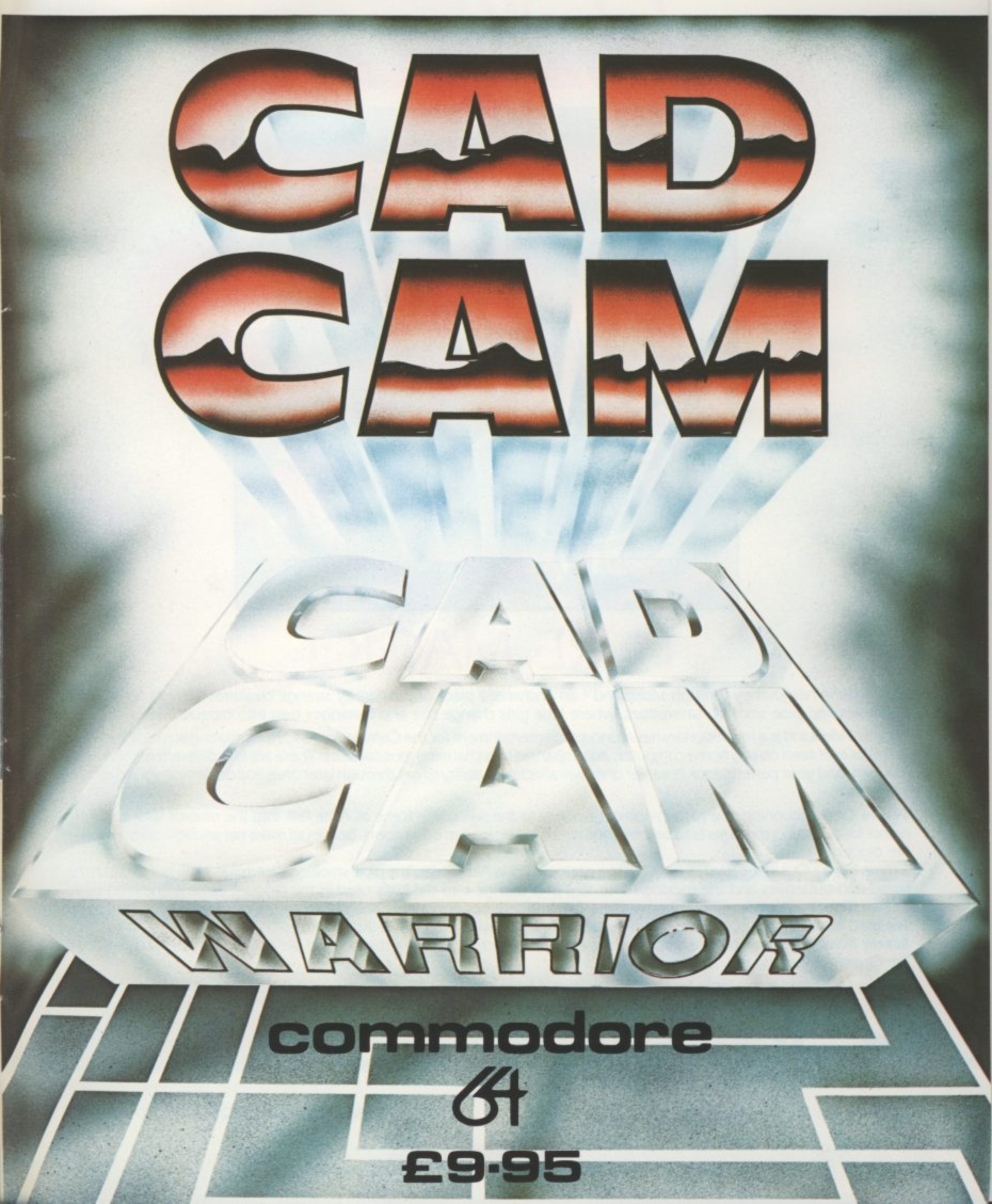
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